
RENOVATIONS FOR SECURITY VESTIBULE AT POMONA PRESCHOOL AND ARTHUR RANN ELEMENTARY SCHOOL

GALLOWAY TOWNSHIP SCHOOL DISTRICT
GALLOWAY TOWNSHIP - ATLANTIC COUNTY - NEW JERSEY



FVHD PROJECT #5192 - Pomona Preschool - NJDOE #1690-040-20-1000
FVHD PROJECT #5193 - Arthur Rann ES - NJDOE #1690-015-20-1000

EDWARDS ENGINEERING GROUP
Consulting Civil Engineers

GILLAN & HARTMANN, INC.
Consulting Mechanical/Electrical Engineers

January 13, 2020

SPECIFICATIONS

for

RENOVATIONS FOR SECURITY VESTIBULE AT POMONA PRESCHOOL AND ARTHUR RANN ELEMENTARY SCHOOL

for the

GALLOWAY TOWNSHIP SCHOOL DISTRICT GALLOWAY TOWNSHIP - ATLANTIC COUNTY - NEW JERSEY

FVHD PROJECT #5192 / NJDOE #1690-040-20-1000
Pomona Preschool, 400 S. Genoa Ave., Egg Harbor, NJ 08215

FVHD PROJECT #5193 / NJDOE #1690-015-20-1000
Arthur Rann Elementary School, 515 S. Eighth Ave., Galloway, NJ 08205

FRAYTAK VEISZ HOPKINS DUTHIE, P.C.

Architects – Planners

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**ADVERTISEMENT FOR BIDS
GALLOWAY TOWNSHIP SCHOOL DISTRICT
ATLANTIC COUNTY, NEW JERSEY**

NOTICE IS HEREBY GIVEN that the Galloway Township Board of Education will accept bids for **Renovations for Security Vestibule at Pomona Preschool and Arthur Rann Elementary School**, together with all work incidental thereto, in accordance with the requirements of the drawings and specifications prepared by Fraytak Veisz Hopkins Duthie, P.C. (FVHD), Architects-Planners, **FVHD Project #5192/5193**.

Sealed Bids will be received for: Single Overall Contract (C009 with C029, C032, and C047)

Sealed Bids are due by Thursday, **February 13, 2020, 2:00 PM**, to the Galloway Township Board of Education; Administrative Offices, 101 South Reeds Road, Galloway, NJ 08205, and will be publicly opened and read immediately thereafter. Any Bid received after that time shall be rejected.

Prebid Meeting is scheduled for Tuesday, **January 28, 2020, 2:00 PM**, at Arthur Rann Elementary School, 515 South 8th Avenue, Galloway, NJ 08205. Attendance at the pre-bid meeting is recommended.

Bid Documents for the proposed Work are on file at the office of the Architect, FVHD, 1515 Lower Ferry Road, Trenton, NJ 08618, www.fvhdpc.com, and may be inspected by prospective bidders during regular business hours. Any bidder should contact the Architect's office at (609) 883-7101 to confirm availability of documents. Bid Documents will be available from the Architect for a non-refundable fee of \$100.00 for disk or paper set available upon deposit of \$250 for each set. Checks payable in advance to Fraytak Veisz Hopkins Duthie, P.C. If contractor requests shipping, a direct shipping account number must be provided to the Architect and for paper sets, a separate non-refundable handling fee of \$25 per set payable in advance. Deposits will be refunded if the bid documents are returned in whole in good condition, bound in proper order, unmarked and returned within ten (10) days after the opening of bids, by a Bidder submitting a bona fide bid. Bidders should only rely on original digital and paper versions of the bidding contract documents obtained directly from the Architect's office. **All questions must be sent only via mail or facsimile at (609) 883-2694 with the job number referenced.**

Bid Proposal shall be submitted in duplicate (one original and one copy) in a sealed envelope, addressed to the owner, bearing the name and address of the bidder, and clearly marked "BID" with the contract title and/or bid number on the outside of the envelope and must be accompanied by a Certified Check, Cashier's Check or Bid Bond drawn to the order of the Owner for not less than ten percent (10%) of the amount of the bid, but in no case in excess of \$20,000; and must be delivered to the above place on or before the hour named. The Board of Education and the Architect assume no responsibility for bids mailed or misdirected in delivery.

If the bid exceeds \$20,000 bidder must be pre-qualified by the New Jersey Division of Property Management and Construction (DPMC), prior to the date that bids are received. Any bid submitted under the terms of New Jersey statutes not including a copy of a valid and active Pre-qualification/Classification Certificate may be rejected as being non-responsive to bid requirements.

Pursuant to N.J.S.A. 18A:18A-25, each proposal shall be accompanied by a Proposition of Surety from a Surety Company stating it will provide each bidder with separate Performance and Payment Bonds, each in the amount of 100% of the contract sum. Also, Surety agrees to furnish Bidder with a Maintenance Bond in required form. The Proposition of Surety shall be executed by an approved surety company authorized to do business in the State of New Jersey and in accordance with N.J.S.A. 2A:44-143, and 2A:44-144 and with the three highest rating categories of rating companies

nationally recognized and listed as per Appendix A (go to www.nj.gov/dobi/surety.htm).

This project is subject to the New Jersey State Prevailing Wage Act, N.J.S.A. 34:11-56.27 et seq.

Pursuant to "The Public Works Contractor Registration Act", N.J.S.A. 34:11-56.48 et seq. (P.L. 199, c.238) bidders and their subcontractors are required to be registered with the New Jersey Department of Labor and Workforce Development and to possess a current certificate by said Department indicating compliance with the Act prior to the time and date that bids are received.

All bidders must comply with the requirements of the New Jersey Law Against Discrimination N.J.S.A. 10:5-1 et seq., Affirmative Action Regulations, N.J.S.A. 10:5-31 et seq. (P.L. 1975, c.127), N.J.S.A. 17:27-1.1 et seq. and N.J.A.C. 6A:7-1.8. An Initial Project Workforce Report will be required from the successful bidder (Form AA-201).

No bid may be withdrawn for a period of sixty (60) days after the date set for the opening thereof. The right is reserved to reject all bids pursuant to N.J.S.A. 18A:18A-22 and to waive minor informalities in the bidding in accordance with applicable law.

By Order of the Galloway Township Board of Education
Joy N. Nixon, CPA, School Business Administrator/Board Secretary

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BIDDING INFORMATION

SECTION 00100 - INSTRUCTIONS TO BIDDERS

1.1 INVITATION TO BID

- A. All Bidders are required to prepare bids in accordance with all plans and specifications (Bid Documents) prepared by Fraytak Veisz Hopkins Duthie, P.C.
- B. **DISCLAIMER:** Bidders should only rely on original digital and paper versions of the bidding contract documents obtained directly from the Architect's office. Fraytak Veisz Hopkins Duthie, PC (FVHD) Architects-Planners is not responsible for any unauthorized copies made of the digital or paper bidding contract documents obtained from sources other than the Architect's office. All information provided by Fraytak Veisz Hopkins Duthie, PC (FVHD) Architects-Planners is intellectual property and is protected under copyright laws. It is not to be used for any purpose other than for the indicated project. Any other use or manipulation of the information is strictly prohibited.
- C. Bids for Contracts as listed in the Advertisement for Bids or Invitation to Bid as hereinafter described, will be received for the performance of the Project. 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 all else necessary to perform and complete the Project in the manner and within the time required, all incidental expenses in connection therewith, all costs on account of loss by damage or destruction of the Project caused by the Contractor, or Contractor's Agent, to the extent that the cost of such loss is not recovered from insurance carried by the Owner and the Contractor, and any additional expenses for unforeseen difficulties encountered, for settlement of damages and for replacement of defective work and materials.
- D. Before submitting a Bid, the Bidder shall become familiar with the Drawings, Specifications and other documents that will form the Contract, shall investigate the site of the Project and make such examination thereof as may be necessary to determine the character and amount of work involved. The Bidder shall also determine that they can secure the necessary labor and equipment and that the materials proposed to use will comply with the requirements specified therefore and can be obtained by the bidder in the quantities and at the time required.
 - 1. **Roofing Projects:** The Bidder shall review Section 07500 regarding the requirement for the Contractor to engage and pay for the services of a qualified independent Roofing Inspection Firm (RIF).
- E. The Owner reserves the right to accept or reject all bids including Alternate Bids, if any, pursuant to applicable law under any Contract for a period up to sixty (60) days after receipt of bids.

1.2 ETHICS IN PURCHASING

A. School District Responsibility

1. Recommendation of Purchases

- a. It is the desire of the Board of Education to have all Board employees and officials practice exemplary ethical behavior in the procurement of goods, materials, supplies, and services.
- b. School district officials and employees who recommend purchases shall not extend any favoritism to any vendor. Each recommended purchase should be based upon quality of the items, service, price, delivery, and other applicable factors in full compliance with N.J.S.A. 18A:18A-1 et seq.
- c. Solicitation/Receipt of Gifts - Prohibited:
 - 1) School district officials and employees are prohibited from soliciting and receiving funds, gifts, materials, goods, services, favors, and any other items of value from vendors doing business with the Board of Education or anyone proposing to do business with the Board of Education.

2. Vendor Responsibility:

- a. Offer of Gifts, Gratuities – Prohibited
 - 1) Any vendor doing business or proposing to do business with the Board of Education, shall neither pay, offer to pay, either directly or indirectly, any fee, commission, or compensation, nor offer any gift, gratuity, or other thing of value of any kind to any official or employee of the Board of Education or to any member of the official's or employee's immediate family.
- b. Vendor Influence – Prohibited:
 - 1) No vendor shall cause to influence or attempt to cause to influence, any official or employee of the Board of Education, in any manner which might tend to impair the objectivity or independence of judgment of said official or employee.

3. Vendor Certification:

- a. Vendors or potential vendors will be asked to certify that no official or employee of the Board of Education or immediate family members are directly or indirectly interested in this request or have any interest in any portions of profits thereof. The vendor participating in this request must be an independent vendor and not an official or employee of the Board of Education.

1.3 OBLIGATION OF BIDDER

- A. At the time of the opening of bids each Bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Drawings and other Contract Documents, including all Addenda and Bulletins. The failure or omission of any Bidder to receive or examine any form, instrument or document or to visit the site and acquaint themselves with conditions there existing, shall not relieve Bidder from any obligation with respect to their bid.
- B. Any and all discrepancies between the drawings and specifications or between trades shall be brought to the attention of the Architect prior to the Contractor(s) bid submission.

1.4 CHALLENGES TO BID SPECIFICATIONS (N.J.S.A. 18A:18A-15)

- A. Any prospective bidder who wishes to challenge a bid specification shall file such challenges in writing with the School Business Administrator/Board Secretary no less than three (3) days prior to the opening of bids. Challenges filed after that date shall be considered void and having no impact on the Board of Education or the award of a contract.

1.5 PREQUALIFICATION OF BIDDERS (CONTRACTORS AND SUBCONTRACTORS)

- A. Pursuant to N.J.S.A. 18A:18A-26.33 et seq., as amended, and N.J.A.C. 17:19-2.1 through N.J.A.C. 17:19-2.7, Bidders on any Contract on public work for a Board of Education in the State of New Jersey in which the entire cost of the Contract exceeds \$20,000.00, must be prequalified by the Division of Property Management and Construction (DPMC), as to character and amount of public work on which they may submit bids. Prequalified bidder must submit with the Bid, a "Notice of Classification" setting forth the type of work and the amount of work for which the bidder has been qualified, that there has been no material adverse change in their qualification information, the total amount of uncompleted work on contracts at the time and the date of the bid due date. Any bid submitted under the terms of New Jersey Statutes not including a copy of a valid and active Prequalification/Classification Certificate may be rejected as being nonresponsive to bid requirements. (Forms for this purpose are available from the Director of the Division of Property Management and Construction - DPMC, Trenton, New Jersey 08625.)
 - 1. Each classified bidder's aggregate rating shall be calculated in accordance with formula prescribed by N.J.A.C. 17:19-2.8.
 - a. Calculations shall be based on Bidder's base bid amount at time of bid or total amount of base bid and accepted Alternate Bids at time of Award.
- B. In accordance with N.J.S.A. 34:11-56.48 et seq. and N.J.S.A. 18A:7G-37, each bidder must be properly registered with the New Jersey Department of Labor and Workforce Development at the time of the bid. The Contractor shall enter into subcontracts only with subcontractors who are registered pursuant to N.J.S.A. 34:11-56.48 et seq.

1. No Contractor/Subcontractor will be permitted to bid on or engage in any contract for public work, as defined in the "New Jersey Prevailing Wage Act," N.J.S.A. 34:11-56.26 et seq. (P.L. 1999, c.238), unless that Contractor/Subcontractor is registered with the New Jersey Department of Labor and Workforce Development at the time of the bid.
- C. The Owner may make such additional investigations as it deems necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that they are properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

1.6 CHANGES TO BID DOCUMENTS, INTERPRETATIONS AND ADDENDA

- A. Changes to the Bid Documents may be required to be issued via Addenda. FVHD will issue notice of the publication of all Addenda to prospective bidders, who have obtained bid documents from FVHD
1. All Addenda issued become a part of the Bid Documents and will be part of the Contract Documents as though originally incorporated into the Project Manual.
 2. A notification of Addenda changes to the bid documents will be faxed to all bidders who have received bid documents from FVHD Architects. Bidders will be responsible to download the applicable Addendum(s) from the Architects website at www.fvhdp.com/bids/bidlisting.aspx.
 3. Bidders must acknowledge receipt of all Addenda on the Bid Form or the bid may be deemed non-responsive by the Owner's Attorney.
- B. Pre-bid Request for Information: No oral interpretations will be made to any Bidder as to the meaning of the drawings and specifications. Every request for such an interpretation shall be made in writing, addressed and forwarded by mail or facsimile transmission to the Architect's office no later than ten (10) business days prior to the bid opening date (not including Federal or State Holidays). All requests must state Pre-Bid Request for Clarification; include the project name and number to the attention of:

Fraytak Veisz Hopkins Duthie, P.C.

Architects / Planners

Ralph Wesner, RA, Project Manager

1515 Lower Ferry Rd, Trenton, NJ 08618

Electronic Facsimile (609) 883-2694

FVHD Project No. 5192 / 5193

1. Every interpretation made to a Bidder will be in the form of an Addendum. During the bidding period, the Architect may furnish Addenda for additions to or alterations of the drawings and specifications, which shall be included in the work covered by the Bid Form(s).
2. Addenda, when issued, will be made available no later than seven (7) business days prior to the date for receiving bids, Saturday, Sunday or holidays excepted, to all persons who have obtained Bid Documents from the Architect.
3. Addenda will also be available for examination at the Architect's office.
4. It shall be the responsibility of the Bidder to ascertain that they have received and examined all Addenda and Bulletins issued, prior to submitting their bid. Failure of the Bidder to download and examine all Addenda shall not relieve the Bidder from any of the requirements of the Bid Documents.

1.7 PREPARATION OF BIDS

- A. Enclose **two copies (one original and one copy)** of the Bid in a sealed envelope, identified on the outside of the envelope and clearly marked "BID" with the name and address of the bidder, name of the project and contract number in which the bidder is submitting.
- B. Bids shall be submitted on the form of Bid furnished by the Architect, properly filled out and duly executed. Bid forms shall not be altered or added to in any way. Lump Sum Bid or Base Bid prices shall be filled in, in ink or typewritten, in both words and figures. In case of discrepancy, the amount described in words shall govern.
 1. **Bids containing any conditions, omissions, unexplained erasure or alteration, items not called for in the Bid Form, attachment of additive information not required by the Specifications, or irregularities of any kind may be rejected by the Owner.**
 2. **Any changes, white-outs, strike-outs, etc. on the Bid Form must be initialed in ink by the person responsible for signing the Bid Form.**
- C. When the Bid is made by an individual, their post office address shall be stated and they shall sign the Bid. When made by a firm or partnership, its name and post office address shall be stated and the Bid shall be signed by one or more of the partners. When made by a corporation, its name and principal post office address shall be stated, and the Bid shall be signed by an authorized official of the corporation.
- D. Alternate Bids and Unit Prices for the various portions of work or Contracts shall be as stated in other Sections of the Specifications.
 1. Attention is called particularly to the requirements for filling in all Alternate Bids called for on the Bid Form, as the Owner reserves the right to award a Contract based upon the possible inclusion of one or more such Alternate Bids.

2. 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.
3. The Alternate Bids must be stated as additions to or deductions from the Base Bid, unless otherwise noted.
4. **The term "No Bid" shall not be used with respect to Alternate Bids and Unit Prices requested on the Bid Forms. The Bidder who does not desire to make a change from the Base Bid under a particular Alternate Bid shall so indicate by using the words "No Change." Failure to bid or use of the term "No Bid" on any Alternate shall cause rejection of entire bid.**
5. Bidders must bid on every alternate bid. Additions to, or deductions from, the base bid shall be indicated in the appropriate blanks on the Bid form with additions to or deductions from the base bid filled in as appropriate. If a particular alternate bid does not result in an addition to or deduction from the base bid, the words "No Change" or N/C" shall be written in the blank for "No Change" on the Bid form, and the words "No Change" shall be written in the blank provided for the purpose of stating the numeric amount in words. Failure to bid on every alternate bid shall render the bid nonresponsive and shall cause the bid to be rejected.

1.8 BID GUARANTEE

- A. The Bid, when submitted, shall be accompanied by a Bid Guarantee in the form of a Certified Check, Cashier's Check or acceptable Bid Bond made payable unconditionally to the Owner, in the sum of ten percent (10%) of the Bid, but in no case in excess of \$20,000.00 and as per Bid Bond Form included:
 1. Bid Bond Form: Bid Bond shall be as per bid form included and shall include an effective and current Power of Attorney authorizing the Attorney-in Fact to bind the surety, on Bid Date and Time, for the full amount of the Bond.
 2. Bid shall be accompanied by a Proposition of Surety in accordance with paragraph 1.7
- B. Pursuant to N.J.S.A. 18A:18A-36, all Bid Guarantees, except those of the three apparent lowest responsible bidders, will be returned, if requested, after ten (10) days from opening of bids, Sundays and holidays excepted. Within three (3) days after the awarding of the contract and the approval of the Contractor's performance bond and payment bond, the bid security of the remaining unsuccessful bidders will be returned, Sundays and holidays excepted.
- C. The Bid Guarantee shall be forfeited if successful Bidder fails to execute the Agreement between Owner and Contractor identified in Section 9 hereof and furnish

the Performance-Payment Bond within ten (10) days after notification of award of Contract to him/her (Sundays and holidays excepted).

1. Any failure by the successful bidder to perform its obligations regarding the time, manner, and substance of compliance with Bidding Documents in relation to the Award of a Contract, shall constitute an Event of Default, entitling the Owner to:
 - a. Demand, from said guarantor, immediate payment of the entire Bid Bond amount, as liquidated damages, not as a penalty, for the delay which is acknowledged and agreed that the Owner will sustain in connection with said Default; and in addition thereto,
 - b. Recovery of any and all other Losses incurred by the Owner, to which the Owner shall, to the fullest extent permitted by Applicable Law, be entitled to recover, including without limitation Special Damages.

1.9 CONTRACT BONDS

- A. Prior to start of guarantee period and before the final payment is made, the Contractor shall provide the Owner with a Maintenance Bond in the amount of ten percent (10%) of Final Contract Amount, to insure the replacement or repair of defective materials or workmanship during the one-year guarantee period. Pursuant to N.J.S.A. 18A:18A-25, Bids shall be accompanied by a Proposition of Surety in form as bound in these documents, assuring that satisfactory arrangements have been made between the surety and the Bidder by which surety agrees to furnish within ten (10) days after notification of award of contract to him/her, furnish and deliver a Performance Bond and Payment Bond; each in the amount of 100% of the amount bid. Also surety agrees to furnish Bidder with a Maintenance Bond in form as bound herein.
 1. The Proposition of Surety shall be executed by an approved surety company authorized to do business in the State of New Jersey and in accordance N.J.S.A. 2A:44-143.
 2. If, at any time after execution and approval of a Contract and Performance-Payment Bond required by Contract Documents, such Bond shall cease to be adequate security for the Owner, the Contractor shall, within five (5) days after notice to do so, furnish a new or additional Bond, in form, sum and signed by such Sureties as shall be satisfactory to the Owner. No further payment shall be deemed due nor shall any further payment be made to the Contractor unless and until such new or additional Bond shall be furnished and approved.
- B. Prior to start of guarantee period and before the final payment is made, the Contractor shall provide the Owner with a Maintenance Bond in the amount of ten percent (10%) of Final Contract Amount, to insure the replacement or repair of defective materials or workmanship during the **two-year** guarantee period.

- C. The cost of all Bonds shall be paid for by the Contractor and shall be included as a part of Contractor's bid price.

1.10 POWER OF ATTORNEY

- A. Attorneys-in-fact who sign Bid Bonds, Performance and Payment Bonds, Maintenance Bonds and Proposition of Surety forms must accompany each bond or proposition with a certified and effectively dated copy of their power-of-attorney.

1.11 FORM OF AGREEMENT

- A. The form of agreement shall be AIA Document A101 Standard Form of Agreement between Owner and Contractor, (Stipulated Sum) 2017 Edition, and in accordance with AIA Document A201 General Conditions of the Contract, 2017 Edition as amended, and all other documents referenced herein.

1.12 CERTIFICATE OF AUTHORITY

- A. All bidders are to submit their Sworn Contractor Certification, a current valid "Certificate of Authority" as issued by the New Jersey Department of Treasury. Reference-N.J.S.A. 18A:7G-37.

1.13 AWARD OF CONTRACT

- A. Award, if made, will be to the lowest responsive and responsible bidder for the Single Overall Building Contract selected to include Alternate Bids, if any, which the Owner chooses to accept, that result(s) in the lowest aggregate total sum pursuant to N.J.S.A. 18A:18A-4.
- B. Award made to a Bidder not a resident of the State of New Jersey is conditioned upon Bidder designating a proper agent in the State of New Jersey on whom service can be made in the event of litigation.
- C. If the successful Bidder is a corporation not organized under the laws of New Jersey, the award of Contract and payment of consideration thereunder shall be conditioned upon the Corporation procuring a "certificate" of authority to transact business in the State of New Jersey pursuant to N.J.S.A. 14A:13-3 and complying with the provisions of N.J.S.A.14A:13-4.
- D. NJ Business Registration Certificate:
 - 1. Pursuant to N.J.S.A. 52:32-44, Galloway Township School District "Contracting Agency") is prohibited from entering into a contract with an entity unless the bidder/proposer/contractor, and each subcontractor that is required by law to be named in a bid/proposal/contract has a valid Business Registration Certificate on file with the Division of Revenue and Enterprise Services within the Department of the Treasury.

2. Prior to contract award or authorization, the contractor shall provide the Contracting Agency with its proof of business registration and that of any named subcontractor(s).
3. Subcontractors named in a bid or other proposal shall provide proof of business registration to the bidder, who in turn, shall provide it to the Contracting Agency prior to the time a contract, purchase order, or other contracting document is awarded or authorized.
4. During the course of contract performance:
 - a. the contractor shall not enter into a contract with a subcontractor unless the subcontractor first provides the contractor with a valid proof of business registration.
 - b. the contractor shall maintain and submit to the Contracting Agency a list of subcontractors and their addresses that may be updated from time to time.
 - c. the contractor and any subcontractor providing goods or performing services under the contract, and each of their affiliates, shall collect and remit to the Director of the Division of Taxation in the Department of the Treasury, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A. 54:32B-1 et seq.) on all sales of tangible personal property delivered into the State. Any questions in this regard can be directed to the Division of Taxation at (609)292-6400. Form NJ-REG can be filed online at <http://www.state.nj.us/treasury/revenue/busregcert.shtml>.
5. Before final payment is made under the contract, the contractor shall submit to the Contracting Agency a complete and accurate list of all subcontractors used and their addresses.
6. Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration as required, or that provides false business registration information, shall be liable for a penalty of \$25 for each day of violation, not to exceed \$50,000, for each proof of business registration not properly provided under a contract with a contracting agency.
7. Emergency Purchases or Contracts
 - a. For purchases of an emergent nature, the contractor shall provide its Business Registration Certificate within two weeks from the date of purchase or execution of the contract or prior to payment for goods or services, whichever is earlier.
- E. The Owner reserves the right to reject all bids, or to waive minor informalities or non-material exceptions in a bid, pursuant to applicable law.
- F. In accordance with requirements of the N.J.S.A. 18A:18A-36(b), execution of the Contract by all parties will be done within 21 days of the notification of the award date, Sundays and holidays excepted, after making the award.

1. The Bidder to whom the contract is awarded shall be required to execute said Contract within twenty (20) days of the Notice of Award.
- G. Upon award of the Contract, the Contractor shall execute and return to the Owner the "Contractor Certification and Consent Upon Award of Contract," attached to the Contract as an Exhibit.
- H. The Owner reserves the right to reject all bids, or to waive minor informalities or non-material exceptions in a bid, pursuant to applicable law.
- I. In accordance with requirements of the N.J.S.A. 18A:18A-36(b), execution of the Contract by all parties will be done within 21 days of the notification of the award date, Sundays and holidays excepted, after making the award.
 1. The Bidder to whom the contract is awarded shall be required to execute said Contract within twenty (20) days of the Notice of Award.

1.14 BID PROTESTS AND CONTRACTOR'S RESPONSIBILITY

- A. Vendors or contractors may contact the Purchasing Agent in writing, when they feel it necessary to challenge a procurement specification item or to protest an award of contract. All challenges and protests will be reviewed by the Purchasing Agent, the District Administrator of the contract and the Board Attorney. All determinations shall be made in writing to the vendor or contractor. The Purchasing Agent pursuant to N.J.S.A. 18A:18A-2 (b) is the School Business Administrator.
- B. A protest filed shall:
 1. Include the name, street address, electronic mail address, and telephone and facsimile numbers of the protester;
 2. Be signed by the protester or its representative;
 3. Identify the bid or solicitation number and date of bid or solicitation;
 4. Include a detailed statement of the legal and factual grounds of protest including copies of relevant documents;
 5. Set forth all information establishing that the protester is an interested party for the purpose of filing a protest;
 6. Set forth all information establishing the timeliness of the protest; and
 7. Provide any or all information pertaining to the bid protest.

1.15 BIDDING DOCUMENTS

- A. The Bidding Documents consist of, but are not limited to, the following:
 1. Instructions to Bidders in accordance with this Section,
 2. General Conditions, AIA Document A201, and as supplemented in the Supplementary General Conditions; Section 00800,

3. Bid Form including attachments as per Bidder's Checklist,
4. Erratum, Addenda, if issued,
5. Specifications: As outlined in the "Index" included in the Project Manual,
6. Drawings: As per List of Drawings indicated on Project Title Sheet and in accordance with Section 00850,
7. Agreement Between Owner & Contractor, AIA Document A101 and as amended by the Project Specifications.

B. Note: The above list is not intended to establish an order of precedence.

1.16 TIME OF COMPLETION AND LIQUIDATED DAMAGES

A. Refer to Section 01800, "Time of Completion and Liquidated Damages."

1.17 STATEMENT OF OWNERSHIP (N.J.S.A. 52:25-24.2)

A. Statement of Ownership

1. No business organization, regardless of form of ownership, shall be awarded any contract for the performance of any work or the furnishing of any goods and services, unless, prior to the receipt of the bid or accompanying the bid of said business organization, bidders shall submit a statement setting forth the names and addresses of all persons and entities that own ten (10%) percent or more of its stock or interest of any type at all levels of ownership.
2. The included Statement of Ownership shall be completed and attached to the bid proposal. This requirement applies to all forms of business organizations, including, but not limited to, corporations and partnerships, publicly-owned corporations, limited partnerships, limited liability corporations, limited liability partnerships, sole proprietorship, and Subchapter S corporations. Failure to submit a disclosure document shall result in rejection of the bid as it cannot be remedied after bids have been opened.
3. Not-for-profit entities should fill in their name, check the not-for-profit box, and certify the form. No other information is required.

1.18 NON-COLLUSION AFFIDAVIT

A. Pursuant to N.J.S.A. 52:34-15, bidder shall submit the Non-Collusion Affidavit, on form as bound herein, prior to the project award.

1.19 FALSE MATERIAL REPRESENTATION / TRUTH IN CONTRACTING

- A. A person commits a crime if the person knowingly makes a material representation that is false in connection with the negotiation, award or performance of a government contract. If the contract amount is for \$25,000.00 or above, the offender is guilty of a crime of the second degree. If the contract amount exceeds \$2,500.00, but is less than \$25,000.00, the offender is guilty of a crime of the third degree. If the contract amount is for \$2,500.00 or less, the offender is guilty of a crime of the fourth degree. Bidder should be aware of the following statutes that represent "Truth in Contracting" laws:
1. N.J.S.A. 2C:21-34, et seq. governs false claims and representations by bidders. It is a serious crime for the bidder to knowingly submit a false claim and/or knowingly make material misrepresentation.
 2. N.J.S.A. 2C:27-10 provides that a person commits a crime if said person offers a benefit to a public servant for an official act performed or to be performed by a public servant, which is a violation of official duty.
 3. N.J.S.A. 2C:27-11 provides that a bidder commits a crime if said person, directly or indirectly, confers or agrees to confer any benefit not allowed by law to a public servant.
 4. Bidder should consult the statutes such as N.J.S.A. 18A:7G-39 or legal counsel for further information.

1.20 CONTRACT

- A. As indicated in the Advertisement for Bids, it is intended to receive sealed bids and to award and administrate contract for the work required by the Contract Documents as follows:

Single Overall Contract

- B. The Bidder shall be a firm classified by the State of New Jersey - Division of Property Management and Construction for the following classification:

Prime General Contractor

C009 - General Construction/Alterations and Additions

and have subcontractor(s) for the following classification(s) of work:

Subcontractors:

C029 - Structural Steel and Ornamental Iron

C032 - HVACR

C047 - Electrical

- C. Pursuant to N.J.S.A. 18A:18A-26, the Bidder shall be in possession of the required DPMC Classification for the specified work.
1. In the case of a Combined Single Overall Bid, if the contractor possess the DPMC Classification in one category, but not in all of the required categories, the Contractor must list the Prime Subcontractor(s) bidding the scope of work for the other categories. The Subcontractor(s) must possess the DPMC Classification(s) in that category.

END OF SECTION 00100

BIDDER'S CHECKLIST

THE FOLLOWING CHECKLIST MUST BE SIGNED AND SUBMITTED WITH THE BID PACKAGE TO THE OWNER AS PART OF THE BID DOCUMENTS.

ITEM

REVIEWED THE CONTRACT DOCUMENTS (INCLUDING THE PERMITS OBTAINED BY THE BOARD), WORK SITE, LOCALITY, AND ALL LOCAL CONDITIONS AND LAWS AND REGULATIONS THAT IN ANY MANNER MAY AFFECT COST, PROGRESS, PERFORMANCE OR FURNISHING OF WORK

REVIEWED GENERAL BOND REQUIREMENTS

REVIEWED AGREEMENT (OWNER/CONTRACTOR)

(*) BIDDER'S PROPOSAL

(*) BID BOND, CERTIFIED CHECK, CASHIER'S CHECK OR ANY COMBINATION THEREOF IN AN AMOUNT NO LESS THAN TEN PERCENT (10%) OF THE TOTAL AMOUNT OF BID, NOT TO EXCEED \$20,000 (TWENTY THOUSAND DOLLARS)

(*) CONSENT OF SURETY (CONTRACTOR)

(*) CONSENT OF SURETY (SUBCONTRACTOR)

If surety is being provided for subcontractors by bidder, please indicate here. ____ initial

(*) SUBCONTRACTOR IDENTIFICATION STATEMENT

(*) OWNERSHIP DISCLOSURE CERTIFICATION

(*) CERTIFICATION OF NO MATERIAL CHANGE OF CIRCUMSTANCES - CONTRACTOR

(*) CERTIFICATION OF NO MATERIAL CHANGE OF CIRCUMSTANCES - SUBCONTRACTOR

(*) NON COLLUSION AFFIDAVIT

(*) DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

(*) AMERICANS WITH DISABILITIES ACT OF 1990

(*) EQUIPMENT CERTIFICATION

(*) CONTRACTOR CERTIFICATION OF QUALIFICATIONS AND CREDENTIALS AFFIDAVIT AND CERTIFICATION FOR ALL PRIME SUBCONTRACTORS REQUIRED TO BE NAMED UNDER (N.J.S.A. 18A:7G-1 ET SEQ.), WHERE APPLICABLE

(*) CURRENT NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT PUBLIC WORKS CONTRACTORS REGISTRATION ACT CERTIFICATE (N.J.S.A. 34:11-56.48) ALL CONTRACTOR(S) AND NAMED SUBCONTRACTOR(S)

BUSINESS REGISTRATION CERTIFICATE - ALL CONTRACTOR(S) AND SUBCONTRACTOR(S) ENCOURAGED TO SUBMIT WITH BID BUT PRIOR TO CONTRACT AWARD

CURRENT NOTICE OF CLASSIFICATION/PRE-QUALIFICATION CERTIFICATE(S) DPMC CLASSIFICATION CERTIFICATE(S) - ALL CONTRACTOR(S) AND SUBCONTRACTOR(S)

BIDDER'S CHECKLIST

DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION (DPMC) FORM 701 - TOTAL AMOUNT OF UNCOMPLETED CONTRACTS - ALL CONTRACTOR(S) AND SUBCONTRACTOR(S)

STATUS OF PRESENT CONTRACTS

TRADE LICENSE

CERTIFICATION OF INSURANCE STATEMENT

PERFORMANCE RECORD CERTIFICATION

COMPLIANCE WITH NEW JERSEY PREVAILING WAGE ACT

POLITICAL CONTRIBUTION DISCLOSURE FORM

NOTE: (*) FAILURE TO SUBMIT THESE DOCUMENTS SHALL BE AUTOMATIC CAUSE FOR REJECTION OF THE BID. ITEMS THAT ARE NOT MARKED (*) MANDATORY ARE ENCOURAGED TO SUBMIT WITH BID BUT MUST BE PROVIDED PRIOR TO THE CONTRACT AWARD.

By signing below, I acknowledge having read and fully understand all the requirements of each of the documents referenced herein.

BIDDER (Signature)

Dated: _____

BIDDER (Print Name)

BID BOND

THE UNDERSIGNED BIDDER and "**Surety**", a corporation duly authorized to transact business in the State of New Jersey, are held and firmly bound unto _____ BOARD OF EDUCATION (the "**OWNER**") for the full and just sum of:

_____ Dollars (\$ _____),
(10% of the Bid Price not to exceed \$20,000.00: words) **(figures)**

The payment of which sum the **BIDDER** has submitted a Bid to perform certain Work described in Bidding Documents entitled:

TITLE: _____

CONTRACT NO.: _____

The **Surety** hereby agrees to pay the full face value of this Bond to the **OWNER**, as Liquidated Damages, and not as a penalty, unless this Bond is void.

This Bond shall only be void if the **BIDDER** well, truly and faithfully performs all requirements contained in the Bidding/Contract Documents incident to an Award of the Contract including, but not limited to, proper execution and submission of the Contract Forms and all other required documentation.

On this _____ day of _____ 20____, the **BIDDER** and **Surety** hereby bind themselves herein:

FOR THE BIDDER:

FOR THE SURETY:

(Name of **BIDDER**)

(Name of **Surety**)

By: _____
(Print Name-**BIDDER's** Authorized Representative)

By: _____
(Print Name of Attorney-in-Fact)

By: _____
(Signature-**BIDDER's** Authorized Representative)

By: _____
(Signature of Attorney-in-Fact)

IMPORTANT – ATTACH AND SUBMIT WITH THE BID:

- **A POWER OF ATTORNEY FOR THE ATTORNEY-IN-FACT WHICH IS CURRENTLY DATED AND VALID FOR THE ENTIRE AMOUNT OF THE BOND**

FORM OF CONSENT OF SURETY

PERFORMANCE BOND, PAYMENT BOND and MAINTENANCE BOND

For and in consideration of the sum of one dollar (\$1.00) lawful money of the United States, the receipt is hereby acknowledged, paid to the undersigned surety, and for other valuable consideration, the undersigned surety, authorized to transact business in the State of _____, certifies and agrees that if the Contract entitled: _____

CONTRACT _____,
(NUMBER) (TITLE)

is awarded to: _____
(BIDDER'S NAME)

the undersigned hereby warrants that it is in all respects qualified to provide the required Bonds as set forth in the Contract Documents, and that it will provide and execute the **Performance Bond** in the full amount of awarded contract in the event that said contractor is awarded a contract for the above project, the **Payment Bond**, and the **Maintenance Bond** in the form and as otherwise required by the Contract Documents.

(Print Name of Surety)

(Print Name of Attorney-in-Fact)

(Signature of Attorney-in-Fact)

ATTACH AND SUBMIT WITH THE BID: A POWER OF ATTORNEY FOR THE ATTORNEY -IN-FACT WHICH IS CURRENTLY DATED AND VALID FOR THE TOTAL AMOUNT OF ALL BONDS.

Consent of Surety must be signed by an authorized agent or representative of a surety company and not by the individual or company representative submitting the bid.

NOTE: IF SUBCONTRACTORS ARE LISTED ON BID FORM, N.J.S.A. 18A:18A-18 REQUIRES THAT EVIDENCE OF PERFORMANCE SECURITY AS TO SUBCONTRACTORS BE SUBMITTED WITH THE BID, EITHER BE THE BIDDER ON ITS OWN BEHALF AND ON BEHALF OF ALL LISTED SUBCONTRACTORS, OR BY EACH SUBCONTRACTOR, OR ANY COMBINATION THEREOF, PROVIDED THAT THE PERFORMANCE SECURITY IN TOTAL EQUALS, BUT DOES NOT EXCEED, THE TOTAL AMOUNT OF THE BID.

SUBCONTRACTOR IDENTIFICATION STATEMENT

The following information is to be provided in the case of all subcontractors who will furnish labor of the various trades governed by N.J.S.A. 18A:18A-18 (b) (**General Construction, Steel, Plumbing, HVAC, Electric, and all DPMC Specialty Trades**, where applicable).

| TRADE | Contractor's Name/Address/Telephone | NJ License No. |
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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. |
|-------|------------------|
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BIDDER _____

STATEMENT OF OWNERSHIP
(OWNERSHIP DISCLOSURE CERTIFICATION)

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 Included with
All Bid and Proposal Submissions**

Name of Business: _____

Address of Business: _____

Name of person completing this form: _____

N.J.S.A. 52:25-24.2:

"No corporation, partnership, or limited liability company shall be awarded any contract nor shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies, unless prior to the receipt of the bid or proposal, or accompanying the bid or proposal of said corporation, said partnership, or said limited liability company there is submitted a statement setting forth 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.

If one or more such stockholder or partner or member is itself a corporation or partnership or limited liability company, the stockholders holding 10 percent or more of that corporation's stock, or the individual partners owning 10 percent or greater interest in that partnership, or the members owning 10 percent or greater interest in that limited liability company, as the case may be, shall also be listed. 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 in this act, has been listed.

To comply with this section, a bidder with any direct or indirect parent entity which is publicly traded may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10 percent or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10 percent or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10 percent or greater beneficial interest."

The Attorney General has advised that the provisions of N.J.S.A. 52:25-24.2, which refer to corporations and partnerships, apply to limited partnerships, limited liability partnerships, and Subchapter S corporations.

This Ownership Disclosure Certification form shall be completed, signed and notarized.

Failure of the bidder/proposer to submit the required information is cause for automatic rejection of the bid or proposal

Part I

Check the box that represents the type of business organization:

- Sole Proprietorship (skip Parts II and III, sign and notarize at the end)
- Non-Profit Corporation (skip Parts II and III, sign and notarize at the end)
- Partnership Limited Partnership Limited Liability Partnership
- Limited Liability Company
- For-profit Corporation (including Subchapters C and S or Professional Corporation)
- Other (be specific): _____

Part II

- I certify that 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.

OR

- I certify that 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 that no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be.

Sign and notarize the form below, and, if necessary, complete the list below. (Please attach additional sheets if more space is needed):

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

Part III - Any Direct or Indirect Parent Entity Which is Publicly Traded:

“To comply with this section, a bidder with any direct or indirect parent entity which is publicly traded may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10 percent or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10 percent or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10 percent or greater beneficial interest.”

Pages attached with name and address of each publicly traded entity as well as the name and address of each person that holds a 10 percent or greater beneficial interest.

OR

Submit here the links to the Websites (URLs) containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent.

AND

Submit here the relevant page numbers of the filings containing the information on each person holding a 10 percent or greater beneficial interest.

Subscribed and sworn before me this ____ day of _____, 20_____.

(Affiant)

(Notary Public)

My Commission expires:

(Print name of affiant and title if applicable)

(Corporate Seal if a Corporation)

PERFORMANCE RECORD

How many years has your organization been in business as a Contractor under your present business name? _____

How many years experience in construction work has your organization had:

(a) As a Prime contractor? _____ (b) As a subcontractor? _____

What is the construction experience of the principal individuals of your organization?

| Individual's Name | Present Position or Office | Years of Constr. Experience | Magnitude and Type of Work | In What Capacity |
|-------------------|----------------------------|-----------------------------|----------------------------|------------------|
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Have you ever failed to complete any work contracted to you? _____

If so, where and why? _____

Has any officer or partner of your organization ever failed to complete a construction contract handled in its own name?

If so, state name of individual, name of owner, location and type of project and reason for the failure to complete.

PERFORMANCE RECORD (Continued)

List of all contracts completed by you.

| Name of Owner | Name & Location of Project/ Type of Work | Prime or Sub- Contractor | Architect or Engineer in Charge for Owner | Contract Price (Omit Cost) | Date Completed | Was* Time Extension Necessary | Were any Penalties Imposed | Were* Liens Claims or Stop Notice Filed |
|---------------|---|-----------------------------|--|-------------------------------------|-------------------|--|----------------------------------|--|
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*Explain "Yes" answers.

PERFORMANCE RECORD
CERTIFICATION

Explanation of details in connection with non-completion of contracts, time extensions, penalties imposed, labor troubles experience, liens, termination of contracts, poor performance, debarment, claims and notices filed against contracts.

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

(Name of Organization)

(Signature)

(Title)

STATE OF)
)ss.
COUNTY OF)

_____, being duly sworn to law, deposes and says that it is authorized to make this affidavit for, and on behalf of, the individual, partnership or corporation herein first named as the Bidder, that deponent is familiar with the books of the said Bidder and that the foregoing statement is a true and accurate statement taken from the books of said Bidder of such financial condition as of the date herein first named; that the answers to the foregoing interrogatories are true and correct.

Subscribed and sworn to before me

This _____ day of _____, 20 ____.

(Signature)

(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____, 20 ____.

COMPLIANCE WITH NEW JERSEY PREVAILING WAGE ACT

Title of Bid: _____

Date: _____

Bidder's Past Record under the New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25, inclusive) and all acts amendatory thereof and supplemental hereto.

Answer each question with a "yes" or "no" entered in the space provided and furnish additional information when required.

1. I certify that our company understands that this project requires prevailing wages to be paid in full accordance with the law.
2. I further certify that all subcontractors named in this bid understand that this project requires the subcontract to pay prevailing wages in full accordance with the law.
3. Has the Bidder been notified by the Commissioner of Labor and Industry by notice issued pursuant to N.J.S.A. 34:11-56:37 that it has been found to be in violation for failure to pay prevailing wages as required by the New Jersey Prevailing Wages Act? _____
4. Has any person having an "Interest" in the Bidder within the meaning of N.J.S.A. 34:11-56:38 been found to be in violation of the New Jersey Prevailing Wage Act as aforesaid? _____
5. Has any person having an "Interest" in the Bidder with the meaning of N.J.S.A. 34:11-56:38 had an "Interest" as aforesaid in any firm, corporation, or partnership which has been found to be in violation of the New Jersey Prevailing Wage Act as aforesaid? _____
6. If the answer to any of the aforesaid questions is "Yes," annex a full statement showing the date of the action taken by the Commissioner of Labor and Industry, the subsequent action, if any, taken with respect to such action of the Commissioner, the name of the person, firm corporation or partnership debarred by the commissioner, and the nature, character and extent of the interest existing between the Bidder and the name which was debarred as aforesaid.

Name of Company:

Authorized Agent:

Authorized Signature:

NON-COLLUSION AFFIDAVIT

STATE OF NEW JERSEY/ _____
(Specify, if 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 _____. (Name of Contractor)

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

By: _____
(Signature of Authorized Representative)

Subscribed and sworn to before me
this _____ day of _____, 20____.

(Seal) Notary Public of New Jersey/

Specify Other State

My Commission Expires _____, 20 ____.

THIS FORM MUST BE COMPLETED, SIGNED, NOTARIZED, AND SUBMITTED WITH BID

CERTIFICATION OF NO MATERIAL CHANGE OF CIRCUMSTANCES

Bidder's Name: _____

Address: _____

1. A statement as to the financial ability, adequacy of plant equipment, organization and prior experience of the Bidder, as required by N.J.S.A. 18A:18A-28 has been submitted to the Department of Treasury within the last twelve (12) months preceding the date of opening of bids for this contract.

2. I certify, as required by N.J.S.A. 18A:18A-32, that there has been no material adverse change in the qualification except:

(Name and Title of Signer - Please print or type)

(Signature)

(Date)

STATUS OF PRESENT CONTRACTS

PURSUANT TO N.J.A.C. 17:19-2.13, BIDDER DECLARES THE FOLLOWING WITH RESPECT TO ITS UNCOMPLETED CONTRACTS, ON ALL WORK, FROM WHATEVER SOURCE (PUBLIC AND PRIVATE), BOTH IN NEW JERSEY AND FROM OTHER GOVERNMENTAL JURISDICTIONS.

- Each classified bidder's aggregate rating shall be calculated in accordance with formula prescribed by N.J.A.C. 17:19-2.8.
- Calculations shall be based on Bidder's base bid amount only at time of bid or total amount of base bid and accepted Alternate Bids at time of Award.

| Entity | Project Title | Original Contract Amount | Uncompleted Amount As of Bid Opening Date | Name and Telephone Number of Party To Be Contacted From Entity For Verification |
|--------|---------------|--------------------------|---|---|
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Sworn and Subscribed to before me
 this _____ day of _____, 20____

BIDDER

Notary Public _____

(Print and Signature)

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.**

* 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.”

C. 271 POLITICAL CONTRIBUTION DISCLOSURE FORM

Required Pursuant To N.J.S.A. 19:44A-20.26

This form or its permitted facsimile must be submitted to the local unit no later than 10 days prior to the award of the contract.

Part I – Vendor Information

| | | | |
|--------------|--|--------|------|
| Vendor Name: | | | |
| Address: | | | |
| City: | | State: | Zip: |

The undersigned being authorized to certify, hereby certifies that the submission provided herein represents compliance with the provisions of N.J.S.A. 19:44A-20.26 and as represented by the Instructions accompanying this form.

| | | |
|-----------|--------------|-------|
| Signature | Printed Name | Title |
| | | |

Part II – Contribution Disclosure

Disclosure requirement: Pursuant to N.J.S.A. 19:44A-20.26 this disclosure must include all reportable political contributions (more than \$300 per election cycle) over the 12 months prior to submission to the committees of the government entities listed on the form provided by the local unit.

Check here if disclosure is provided in electronic form.

| Contributor Name | Recipient Name | Date | Dollar Amount |
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Check here if the information is continued on subsequent page(s)

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

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 _____ |

Delete

ADD AN ADDITIONAL ACTIVITIES ENTRY

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: _____

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

The contractor and the Board of Education (hereafter "owner") do hereby agree that the provisions of Title 11 of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. S121 01 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant there unto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the 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, of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any 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's 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 proceeding 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 contract 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 of their performance of this Agreement. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the 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 _____

Authorized Agent _____

Title or Position _____

Signature _____

Date _____

EQUIPMENT CERTIFICATION

Title of Bid

Bid No. **00-00**

Bid Date: **Weekday, Month 00, 2000**

In accordance with N.J.S.A. 18A:18A-23, I hereby certify that

A) _____ *(Name of Company)* owns all the necessary equipment as required by the specifications and to complete the specified public work project.

or

B) _____ *(Name of Company)* leases or controls all the necessary equipment as required by the specifications and to complete the specified public work project.

PLEASE NOTE: If your company is not the actual owner of the equipment, **you shall submit with the bid**

1. A certificate stating the source from which the equipment will be obtained and
2. Obtain and submit with the bid a certificate from the owner and person in control of the equipment, definitely granting to the bidder the control of the equipment required during such time it may be necessary for the completion of that portion of the contract for which said equipment will be necessary.

Name of Company _____

Authorized Agent _____ Title _____

Authorized Signature _____

**CONTRACTOR / SUBCONTRACTOR CERTIFICATION OF
QUALIFICATIONS AND CREDENTIALS**

CONTRACTOR

STATE OF NEW JERSEY/ _____
(Specify, if 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, or a Subcontractor to the Bidder required
to be named under (N.J.S.A. 18A:7G-1 et al. and N.J.S.A. 18A:18A-18), and that I executed the said
Proposal with full authority to do so. Pursuant to N.J.S.A. 18A:7G-37, the firm of
_____ possess the following qualifications and credentials:

- (1) A current, valid Certificate of Registration from the Department of Labor issued pursuant to "The Public Works Contractor Registration Act," P.L.1999, c. 238 (C.34: 11-56.48 et seq.), a copy of which is attached hereto.
- (2) A current, valid "Certificate of Authority to perform work in New Jersey"/Notice of Classification issued by the Department of the Treasury, a copy of which is attached hereto.
- (3) A current, valid Contractor or Trade License required under applicable New Jersey law for any trade or specialty area in which the firm seeks to perform work, a copy of which is attached hereto.
- (4) A suitable quality control and quality assurance program, as well as an appropriate safety and health plan that the firm will have in place during the term of construction of the School Facilities Project.

- (5) An executed Affidavit, attached hereto, demonstrating that the amount of the firm's Bid Proposal and the value of all of its outstanding incomplete contracts does not exceed the firm's existing aggregate rating limit, as well as a certified copy of Department of the Treasury Form DPMC 701.

Name of Contractor

By: _____
(Signature of Authorized Representative)

Subscribed and sworn to before
me this ____ day of _____, 20 ____.

(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____ 20 ____.

**THIS FORM MUST BE COMPLETED, SIGNED, NOTARIZED,
AND SUBMITTED WITH BID**

**CONTRACTOR / SUBCONTRACTOR CERTIFICATION OF
QUALIFICATIONS AND CREDENTIALS**

SUBCONTRACTOR

STATE OF NEW JERSEY/_____

Specify, if 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, or a Subcontractor to the Bidder required to be
named under (N.J.S.A. 18A:7G-1 et al. and N.J.S.A. 18A:18A-18), and that I executed the said
Proposal with full authority to do so. Pursuant to N.J.S.A. 18A:7G-37, the firm of

_____ possess the following qualifications and credentials:

- (1) A current, valid Certificate of Registration from the Department of Labor issued pursuant to "The Public Works Contractor Registration Act," P.L.1999, c. 238 (C.34: 11-56.48 et seq.), a copy of which is attached hereto.
- (2) A current, valid "Certificate of Authority to perform work in New Jersey"/Notice of Classification issued by the Department of the Treasury, a copy of which is attached hereto.
- (3) A current, valid Contractor or Trade License required under applicable New Jersey law for any trade or specialty area in which the firm seeks to perform work, a copy of which is attached hereto.
- (4) A suitable quality control and quality assurance program, as well as an appropriate safety and health plan that the firm will have in place during the term of construction of the School Facilities Project.

- (5) An executed Affidavit, attached hereto, demonstrating that the amount of the firm's Bid Proposal and the value of all of its outstanding incomplete contracts does not exceed the firm's existing aggregate rating limit, as well as a certified copy of Department of the Treasury Form DPMC 701.

Name of Contractor

By: _____
(Signature of Authorized Representative)

Subscribed and sworn to before
me this ____ day of _____, 20 ____ .

(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____ 20 ____ .

**THIS FORM MUST BE COMPLETED, SIGNED, NOTARIZED,
AND SUBMITTED WITH BID**

CONTRACTOR / SUBCONTRACTOR CERTIFICATION OF
QUALIFICATIONS AND CREDENTIALS FORM

CERTIFICATION OF INSURANCE STATEMENT

The Bidder fully understands the Owner's insurance requirements as stated in the Supplementary Conditions and agrees to provide all insurance required by these documents at award of contract.

COMPANY NAME

BIDDER (Signature)

BIDDER (Print Name)

Note: Failure to sign this document may result in the rejection of your Proposal.

CERTIFICATION OF INSURANCE STATEMENT

EXHIBIT B

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE

N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127)

N.J.A.C. 17:27-1.1 et seq.

CONSTRUCTION CONTRACTS

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

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

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

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

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

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

EXHIBIT B (Cont)

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

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

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

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

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

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

EXHIBIT B (*Cont*)

(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 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.

EXHIBIT B (Cont)

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

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

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-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 N.J.A.C. 17:27-1.1 et seq.

Surety Disclosure Statement and Certification
N.J.S. A. 2A:44-143

SAMPLE

SURETY DISCLOSURE STATEMENT AND CERTIFICATION

....., surety(ies) on the attached bond, hereby certifies(y) the following:

(1) The surety meets the applicable capital and surplus requirements of R.S.17:17-6 or R.S.17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.

(2) The capital (where applicable) and surplus, as determined in accordance with the applicable laws of this State, of the surety(ies) participating in the issuance of the attached bond is (are) in the following amount(s) as of the calendar year ended December 31, (most recent calendar year for which capital and surplus amounts are available), which amounts have been certified as indicated by certified public accountants (indicating separately for each surety that surety's capital and surplus amounts, together with the name and address of the firm of certified public accounts that shall have certified those amounts):

.....
.....
.....

(3) (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. 9305, the underwriting limitation established therein and the date as of which that limitation was effective is as follows (indicating for each such surety that surety's underwriting limitation and the effective date thereof):

.....
.....
.....

(b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S.17:18-9 as of (date on which such limitation was so established) is as follows (indicating for each such surety that surety's underwriting limitation and the date on which that limitation was established):

.....
.....
.....

(4) The amount of the bond to which this statement and certification is attached is \$

(5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, or both, then for each such contract of reinsurance:

(a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows:.....

.....

.....

.....; and

(b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L.[1993, c.243](#) (C.17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.

CERTIFICATE

(to be completed by an authorized certifying agent

for each surety on the bond)

I (name of agent), as (title of agent) for (name of surety), a corporation/mutual insurance company/other (indicating type of business organization) (circle one) domiciled in (state of domicile), DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOIDABLE.

.....

(Signature of certifying agent)

.....

(Printed name of certifying agent)

.....

(Title of certifying agent)

L.1951 (1st SS), c.344; amended [1979, c.408](#); [1989, c.316](#); [1991, c.454](#); 1995, c.38, s.2; [1995, c.384](#), s.1; [1996, c.81](#), s.2.

PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ as PRINCIPAL and sureties with underwriting office at _____ to which all communication in regard to this bond should be addressed, a Corporation organized and existing under the laws of the State of _____ and duly authorized to do business in the state of New Jersey, as SURETY, are hereby held and firmly bound unto the _____ in the penal sum of _____, for payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

SIGNED and SEALED this _____ day of _____ two thousand and _____.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT, WHEREAS, the above named Principal did on the _____ day of _____, 20____, entered into a contract with _____ identified as _____ which said contract, upon execution by the Owner, and the Principal, will be a part of this bond the same as though set forth herein.

Now, if the said Principal shall well and faithfully do and perform each and every, all and singular, the things agreed by it (or them) to be done and performed according to the terms of said contract, and shall pay all lawful claims of beneficiaries as defined by N.J.S.2A:44-143 for labor performed or materials, provisions, provender or other supplies or teams, fuels, oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said contract, we agreeing and assenting that this undertaking shall be for the benefit of any beneficiary as defined in N.J.S.2A:44-143 having a just claim, as well as for the oblige herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety hereby stipulated and agrees that no modifications, omissions or additions in or to the terms of the said contract, or in or to the plans or specifications therefore, shall in anyway affect the obligations of said Surety on its bond.

Recovery of any claimant under the bond shall be subject to the conditions and provisions of this article to the same extent as if such conditions and provisions were fully incorporated in the form set forth above.

Principal:

By: _____
Print Name:
Print Title:

Affix
Corporate
Seal

Witness

Print or Type Name

Surety:

By: _____
Print Name:
Print Title:

Affix
Corporate
Seal

Witness

Print or Type Name

PAYMENT BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ as PRINCIPAL and sureties with underwriting office at _____ to which all communication in regard to this bond should be addressed, a Corporation organized and existing under the laws of the State of _____ and duly authorized to do business in the state of New Jersey, as SURETY, are hereby held and firmly bound unto the _____ in the penal sum of _____, for payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

SIGNED and SEALED this _____ day of _____ two thousand and _____.

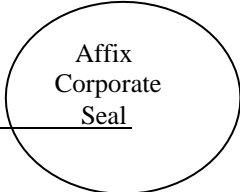
THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT, WHEREAS, the above named Principal did on the _____ day of _____, 20____, entered into a contract with _____ identified as _____ which said contract, upon execution by the Owner, and the Principal, will be a part of this bond the same as though set forth herein.

Now, if the said Principal shall pay all lawful claims of beneficiaries as defined by N.J.S.2A:44-143 for labor performed or materials, provisions, provender or other supplies or teams, fuels, oils, implement or machinery furnished, used or consumed in carrying forward, performing or completing of said contract, we agreeing and assenting that this undertaking shall be for the benefit of any beneficiary as defined in N.J.S.2A;44-143 having a just claim, as well as for the party of the first part mentioned in the contract aforesaid; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety hereby stipulated and agrees that no modifications, omissions or additions in or to the terms of the said contract, or in or to the plans or specifications therefore, shall in anyway affect the obligations of said Surety on its bond.

Principal:

By: _____
Print Name:
Print Title:

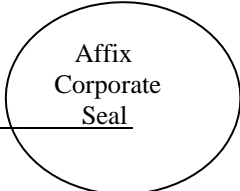


Witness

Print or Type Name

Surety:

By: _____
Print Name:
Print Title:



Witness

Print or Type Name

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned,

as principal, and _____ a Corporation organized and existing under the laws of the state of _____, and duly authorized to do business in the State of New Jersey, as Surety, are held and firmly bound unto the _____ as Owner, in the penal sum of _____

(10% of the Final Contract Amount)

for payment of which, well and truly to be made, we hereby, jointly, and severally, bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That whereas

the above named principal did on the _____ day of _____, 20____, enter into a Contract with the Owner for _____

(Project Name)

which said Contract is made a part of this bond the same as though set forth herein.

NOW, if the said principal shall remedy without cost to the Owner any defects which may develop during the one (1) year Maintenance Period of the work performed under the said Contract, provided such defects, in the judgment of the Owner are caused by defective or inferior materials or workmanship, then this obligation shall be void, otherwise it shall be and remain in full force and effect. The one (1) year period shall commence on the date established in the Certificate of Substantial Completion.

The said Surety hereby stipulates and agrees that no modifications, deletions or additions in or to the terms of the said Contract or the plans or specifications therefor shall in any way affect its obligations on this bond.

Signed and Sealed this _____ day of _____, 20__.

(Principal) (Seal)

(Witness)

(Title)

(Surety) (Seal)

(Witness)

(Title)

STATE OF NEW JERSEY

DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT
CONSTRUCTION EEO COMPLIANCE MONITORING PROGRAM

Assignment

Code

FORM AA-201

Revised 11/11

INITIAL PROJECT WORKFORCE REPORT CONSTRUCTION

For instructions on completing the form, go to: http://www.state.nj.us/treasury/contract_compliance/pdf/aa201ins.pdf

| | | | | | | | | | | |
|---|---------------------------|--------------------------------|--------|--|------------------------------|---------------|--------|--------------------------|---------------------------|--|
| 1. FID NUMBER | | 2. CONTRACTOR ID NUMBER | | 5. NAME AND ADDRESS OF PUBLIC AGENCY AWARDDING CONTRACT | | | | | | |
| 3. NAME AND ADDRESS OF PRIME CONTRACTOR | | | | Name: | | | | | | |
| | | | | Address: | | | | | | |
| (Name) | | | | CONTRACT NUMBER | | DATE OF AWARD | | DOLLAR AMOUNT OF AWARD | | |
| (Street Address) | | | | 6. NAME AND ADDRESS OF PROJECT | | | | 7. PROJECT NUMBER | | |
| (City) (State) (Zip Code) | | | | | | | | | | Name: |
| 4. IS THIS COMPANY MINORITY OWNED [] OR WOMAN OWNED [] | | | | Address: | | | | | | |
| | | | | COUNTY | | | | | | 8. IS THIS PROJECT COVERED BY A PROJECT LABOR AGREEMENT (PLA)? YES <input type="checkbox"/> |
| 9. TRADE OR CRAFT | PROJECTED TOTAL EMPLOYEES | | | | PROJECTED MINORITY EMPLOYEES | | | | PROJECTED PHASE - IN DATE | PROJECTED COMPLETION DATE |
| | MALE | | FEMALE | | MALE | | FEMALE | | | |
| | J | AP | J | AP | J | AP | J | AP | | |
| 1. ASBESTOS WORKER | | | | | | | | | | |
| 2. BRICKLAYER OR MASON | | | | | | | | | | |
| 3. CARPENTER | | | | | | | | | | |
| 4. ELECTRICIAN | | | | | | | | | | |
| 5. GLAZIER | | | | | | | | | | |
| 6. HVAC MECHANIC | | | | | | | | | | |
| 7. IRONWORKER | | | | | | | | | | |
| 8. OPERATING ENGINEER | | | | | | | | | | |
| 9. PAINTER | | | | | | | | | | |
| 10. PLUMBER | | | | | | | | | | |
| 11. ROOFER | | | | | | | | | | |
| 12. SHEET METAL WORKER | | | | | | | | | | |
| 13. SPRINKLER FITTER | | | | | | | | | | |
| 14. STEAMFITTER | | | | | | | | | | |
| 15. SURVEYOR | | | | | | | | | | |
| 16. TILER | | | | | | | | | | |
| 17. TRUCK DRIVER | | | | | | | | | | |
| 18. LABORER | | | | | | | | | | |
| 19. OTHER | | | | | | | | | | |
| 20. OTHER | | | | | | | | | | |

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

(Signature)

10. (Please Print Your Name)

(Title)

(Area Code)

(Telephone Number)

(Ext.)

(Date)

State Of New Jersey

*Department of Labor & Workforce Development
Construction EEO Compliance Monitoring Program*

MONTHLY PROJECT WORKFORCE REPORT - CONSTRUCTION

For instructions on completing the form, go to:
http://www.state.nj.us/treasury/contract_compliance/pdf/aa202ins.pdf

| | | | |
|--|---|-----------------------------|--|
| 1. Name and address of Prime Contractor (NAME) | 2. Contractor ID Number | 3. F ID or SS Number | 4. Reporting Period |
| (ADDRESS) | 5. Public Agency Awarding Contract | | Date of Award |
| (CITY) | (STATE) | (ZIP CODE) | 6. Name and Location of Project County |
| | | | 7. Project ID Number |

| 8. CONTRACTOR NAME (LIST PRIME CONTRACTOR WITH SUBS FOLLOWING) | 9. PERCENT OF WORK COMPLETED | 10. TRADE OR CRAFT | CLASSI- FICATION (SEE REVERSE) | 11. NUMBER OF EMPLOYEES | | | | | | 12. TOTAL | 13. WORK HOURS | | 14. % OF WORK HRS | | 15. CUM. WORK HRS | | 16. CUM. % OF W/H | | | |
|--|------------------------------------|--------------------------|---|-------------------------|-------|----------|--------------------|-------|---------|--------------|----------------|-------------|-------------------|-------------|-------------------|---------------|-------------------|-----------------|-------------|-------------|
| | | | | A. | B. | C. | D. | E. | F. | NO. OF | TOTAL | A. | B. | A. | B. | TOTAL | A. | B. | A. | B. |
| | | | | TOTAL | BLACK | HISPANIC | AMERICAN INDIAN | ASIAN | FEMALES | MIN. EMP. | WORK HOURS | MIN. W/H | FEMALE W/H | % OF W/H | % OF W/H | WORK HOURS | MIN. HOURS | FEMALE HOURS | % OF W/H | % OF W/H |
| | | | J | | | | | | | | | | | | | | | | | |
| | | | AP | | | | | | | | | | | | | | | | | |
| | | | J | | | | | | | | | | | | | | | | | |
| | | | AP | | | | | | | | | | | | | | | | | |
| | | | J | | | | | | | | | | | | | | | | | |
| | | | AP | | | | | | | | | | | | | | | | | |
| | | | J | | | | | | | | | | | | | | | | | |
| | | | AP | | | | | | | | | | | | | | | | | |
| | | | J | | | | | | | | | | | | | | | | | |
| | | | AP | | | | | | | | | | | | | | | | | |

17. COMPLETED BY (PRINT OR TYPE)

| | | |
|--------|-------------|---------|
| (NAME) | (SIGNATURE) | (TITLE) |
|--------|-------------|---------|

| | | | |
|-------------|--------------------|--------|--------|
| (AREA CODE) | (TELEPHONE NUMBER) | (EXT.) | (DATE) |
|-------------|--------------------|--------|--------|



STATE OF NEW JERSEY
Department of Labor and Workforce Development
Division of Wage and Hour Compliance - Public Contracts Section
PO Box 389
Trenton, NJ 08625-0389

PREVAILING WAGE RATE DETERMINATION

The New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) requires that the Department of Labor and Workforce Development establish and enforce a prevailing wage level for workers engaged in public works in order to safeguard their efficiency and general well being and to protect them as well as their employers from the effects of serious and unfair competition.

Prevailing wage rates are wage and fringe benefit rates based on the collective bargaining agreements established for a particular craft or trade in the locality in which the public work is performed. In New Jersey, these rates vary by county and by the type of work performed.

Applicable prevailing wage rates are those wages and fringe benefits in effect on the date the contract is awarded. All pre-determined rate increases listed at the time the contract is awarded must also be paid, beginning on the dates specified. Rates that have expired will remain in effect until new rates are posted.

Prevailing Wage Rate

The prevailing wage rate for each craft will list the effective date of the rate and the following information:

W = Wage Rate per Hour **B** = Fringe Benefit Rate per Hour* **T** = Total Rate per Hour

* Fringe benefits are an integral part of the prevailing wage rate. Employers not providing such benefits must pay the fringe benefit amount directly to the employee each payday. Employers providing benefits worth less than the fringe benefit amount must pay the balance directly to the employee each payday.

Unless otherwise stated in the Prevailing Wage Rate Determination, the fringe benefit rate for overtime hours remains at the straight time rate.

When the Overtime Notes in the Prevailing Wage Rate Determination state that the overtime rates are "inclusive of benefits," the benefit rate is increased by the same factor as the wage rate (i.e. multiplied by 1.5 for time and one-half, multiplied by 2 for double time, etc.).

Apprentice Rate Schedule

An "apprentice" is an individual who is registered with the United States Department of Labor - Office of Apprenticeship and enrolled in a certified apprenticeship program during the period in which they are working on the public works project.

The apprentice wage rate is a percentage of the journeyman wage rate, unless otherwise indicated. The apprentice benefit rate is the full journeyman benefit rate, unless otherwise indicated.

If there is no apprentice rate schedule listed, the individual must be paid at least the journeyman rate even if that individual is in a certified apprentice program for that trade.

If there is no ratio of apprentices to journeymen listed for a particular craft, then the ratio shall be one (1) apprentice to every four (4) journeymen.

Comments/Notes

For each craft listed there will be comments/notes that cover the definition of the regular workday, shift differentials, overtime, recognized holidays, and any other relevant information.

Public Works Contractor Registration

The Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48, et seq.) requires that **all** contractors, subcontractors, or lower tier subcontractors who are working on or who bid on public works projects register with the Department of Labor and Workforce Development. Applications are available at www.nj.gov/labor (click on Wage & Hour and then go to Registration & Permits).

Pursuant to N.J.S.A. 34:11-56.51:

No contractor shall bid on any contract for public work as defined in section 2 of P.L.1963, c. 150 (C.34:11-56.26) unless the contractor is registered pursuant to this act. No contractor shall list a subcontractor in a bid proposal for the contract unless the subcontractor is registered pursuant to P.L.1999, c.238 (C.34:11-56.48 et seq.) at the time the bid is made. No contractor or subcontractor, including a subcontractor not listed in the bid proposal, shall engage in the performance of any public work subject to the contract, unless the contractor or subcontractor is registered pursuant to that act.

Snow Plowing

Snow plowing contracts are not subject to the New Jersey Prevailing Wage Act or the Public Works Contractor Registration Act.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Air Conditioning & Refrigeration - Service and Repair

PREVAILING WAGE RATE

| | |
|-----------------------|----------------------------|
| | 05/10/19 |
| Journeyman (Mechanic) | W39.08 B24.87 T63.95 |

Craft: Air Conditioning & Refrigeration - Service and Repair

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|---------------|------------------|----------|----------|----------|----------|----------|--|----------|----------|------|
| | Mo. 1-3 | Mo. 4-12 | 2nd Year | 3rd Year | 4th Year | 5th Year | | Wage = % | of Jnymn | Wage |
| As Shown | | | | | | | | | | |
| Wage and Bene | 50% | 55% | 60% | 65% | 75% | 85% | | Bene = % | of Jnymn | Bene |

Ratio of Apprentices to Journeymen - 1:4

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 3-1-13:

| INTERVAL | PERIOD AND RATES | | | | | | | |
|------------------|------------------|----------|----------|----------|----------|--|------------------------|--|
| As Shown | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | | Wage =% of Jnymn Wage | |
| Wage and Benefit | 40% | 50% | 60% | 70% | 80% | | Bene. =% of Jnymn Bene | |

Craft: Air Conditioning & Refrigeration - Service and Repair

COMMENTS/NOTES

THESE RATES MAY BE USED FOR THE FOLLOWING:

- Service/Repair/Maintenance Work to EXISTING facilities.
- Replacement or Installation of air conditioning and refrigeration equipment when the combined tonnage does not exceed 15 tons for refrigeration, or 25 tons for air conditioning.
- Replacement or Installation of "packaged" or "unitary" rooftop-type units when the combined tonnage of the units does not exceed 75 tons.

NOTE: These rates may NOT be used for any work in new construction (including work on new additions).

The regular workday shall consist of 8 hours, starting between 6:00 AM and 10:00 AM, Monday through Friday.

SHIFT DIFFERENTIALS:

- The second and third shifts shall be paid an additional 15% of the hourly rate.
- All shifts must run for a minimum of 5 consecutive days.

OVERTIME:

Hours worked in excess of 8 per day or before or after the regular workday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Boilermaker PREVAILING WAGE RATE

| | 01/01/19 | 01/01/20 |
|-----------------|----------------------------|----------------------------|
| Foreman | W49.72 B44.34 T94.06 | W50.88 B45.21 T96.09 |
| General Foreman | W51.72 B45.34 T97.06 | W52.88 B46.22 T99.10 |
| Journeyman | W44.72 B42.70 T87.42 | W45.88 B43.54 T89.42 |

Craft: Boilermaker APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|-------|-------|-------|-------|-------|-------|--|--|--|
| | 65% | 70% | 75% | 80% | 85% | 90% | 95% | | | |
| 1000 Hours | | | | | | | | | | |
| Benefit = | 36.36 | 37.26 | 38.18 | 39.07 | 39.39 | 40.89 | 41.79 | | | |

Ratio of Apprentices to Journeymen - *

* 1 apprentice will be allowed for the first 5 journeymen, 1 apprentice for the next 10 journeymen and 1 apprentice for each succeeding 20 journeymen up to a maximum of 5 apprentices per contractor on any one job

Craft: Boilermaker COMMENTS/NOTES

APPRENTICE RATE SCHEDULE AS OF 1-1-20:

| INTERVAL | PERIOD AND RATES | | | | | | | |
|------------|------------------|-------|-------|-------|-------|-------|-------|--|
| 1000 Hours | 65% | 70% | 75% | 80% | 85% | 90% | 95% | |
| Benefits | 37.08 | 37.99 | 39.49 | 39.84 | 40.78 | 41.70 | 42.61 | |

HIGH WORK: All apprentices working on the erection, repair, or dismantling of smoke stacks, standpipes, or water towers shall be paid the Journeyman rate.

The regular workday shall consist of 8 hours, between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall work 7½ hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 10%.
- The third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 20%.
- For "Municipal Water Works" projects only, the following shall apply: Two, four day, 10 hour shifts may be worked at straight time Monday through Thursday. The day shift shall work four days, at 10 hours, for 10 hours pay. The second shift shall work four days, at nine and a half hours, for 10 hours pay, plus 10% the hourly rate for new work and .25 cents on repair work. Friday may be used as a make-up day at straight time, due to weather conditions, holiday or any other circumstances beyond the employer's control.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.
- If any other craft employed by the same contractor, or a subcontractor thereof, receives double time in lieu of time and

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

one-half, then the Boilermaker shall receive double time in lieu of time and one-half.

- For "Municipal Water Works" projects only, the following shall apply: Four 10 hour days may be worked Monday through Thursday at straight time. Friday may be used as a make-up day for a day lost to inclement weather, holiday or other conditions beyond the control of the employer. Overtime shall be paid for any hours that exceed 10 hours per day or 40 hours per week.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Boilermaker - Minor Repairs

PREVAILING WAGE RATE

| | 01/01/19 | 01/01/20 |
|-----------------|----------------------------|----------------------------|
| Foreman | W32.80 B16.37 T49.17 | W33.62 B16.47 T50.09 |
| General Foreman | W33.30 B16.37 T49.67 | W34.12 B16.47 T50.59 |
| Mechanic | W31.30 B16.37 T47.67 | W32.12 B16.47 T48.59 |

Craft: Boilermaker - Minor Repairs

COMMENTS/NOTES

NOTE: These rates apply to MINOR REPAIR WORK ONLY (repair work in the field for which the contract amount does not exceed \$125,000.00), for boilers that do not produce electric or are not used in the heating of petroleum products.

OVERTIME:

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Bricklayer, Stone Mason

PREVAILING WAGE RATE

| | 11/01/19 |
|----------------|----------------------------|
| Deputy Foreman | W46.56 B33.17 T79.73 |
| Foreman | W49.56 B33.17 T82.73 |
| Journeyman | W43.56 B33.17 T76.73 |

Craft: Bricklayer, Stone Mason

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|------|------|------|-------|-------|-------|-------|--|--|
| | 40% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | | |
| 6 Months | | | | | | | | | | |
| Benefits | 3.86 | 4.83 | 5.31 | 5.80 | 21.83 | 23.27 | 24.72 | 26.15 | | |

Ratio of Apprentices to Journeymen - 1:5

Craft: Bricklayer, Stone Mason

COMMENTS/NOTES

APPRENTICE RATE SCHEDULE AS OF 11-1-19:

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|------|------|------|-------|-------|-------|-------|--|--|
| 6 Months | 40% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | | |
| Benefits | 3.92 | 4.90 | 5.39 | 5.88 | 21.92 | 23.37 | 24.82 | 26.26 | | |

The regular workday shall consist of 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- When a 2 shift schedule (including a day shift) is established, the first, or day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 10%, inclusive of benefits.

OVERTIME:

- The first 2 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. The first 10 hours on Saturday shall be paid at time and one-half the

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

- Saturday may be used as a make-up day for hours lost to inclement weather.

- When Bricklayers/Stone Masons work on Saturday with Laborers, and no other crafts are working on the project for the day, benefits may be paid at straight time. If other crafts are present, the applicable overtime rate for benefits shall be paid.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Carpenter PREVAILING WAGE RATE

| | 05/10/19 | 05/01/20 |
|------------|----------------------------|----------------------------|
| Foreman | W58.00 B33.64 T91.64 | W60.27 B34.98 T95.25 |
| Journeyman | W50.43 B29.33 T79.76 | W51.36 B29.90 T81.26 |

Craft: Carpenter APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|-----------|------------------|--------|-----------|------|---------|----------|----------|--|--|--|
| Yearly | 40% | 55% | 65% | 80% | 90% | | | | | |
| Benefit = | 57% of | Appren | tice Wage | Rate | for all | intevals | + \$0.59 | | | |

Ratio of Apprentices to Journeymen - 1:3

Craft: Carpenter COMMENTS/NOTES

APPRENTICE RATE SCHEDULE AS OF 5-1-20:

INTERVAL PERIOD AND RATES
 Yearly 40% 55% 65% 80% 90%
 Benefit 57% of apprentice wage rate for all intervals + \$0.63

FOREMAN REQUIREMENTS:

- When there are 2 or more Carpenters on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Carpenters on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:

- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:

- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Carpenter - Resilient Flooring

PREVAILING WAGE RATE

| | |
|------------|----------------------------|
| | 05/10/19 |
| Foreman | W58.00 B33.55 T91.55 |
| Journeyman | W50.43 B29.24 T79.67 |

Craft: Carpenter - Resilient Flooring

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|-----------|------------------|--------|------|------|---------|-----------|----------|--|--|--|
| Yearly | 40% | 55% | 65% | 80% | 90% | | | | | |
| Benefit = | 57% of | Appren | tice | Wage | for all | intervals | + \$0.49 | | | |

Ratio of Apprentices to Journeymen - *

* Ratio is 1 apprentice to 2 journeymen. No more than 3 apprentices may be on any 1 project

Craft: Carpenter - Resilient Flooring

COMMENTS/NOTES

FOREMAN REQUIREMENTS:

- On any job where there are 4 or more Carpenters of Resilient Flooring, 1 must be designated a Foreman.

FOR SYNTHETIC TURF INSTALLATION ONLY:

- The rate shall be 90% of the wage and benefit rate.

The regular workday consists of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:

- When a 2 shift schedule (including a day shift) is established, the day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular wage rate plus 10%.

- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular wage rate, the second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.

- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.

- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:

- Hours in excess of 8 per day or 40 per week, or before or after the regular workday, Monday through Friday, shall be paid at time and one-half the wage rate. Saturday may be used as a make-up day, at straight time, up to 8 hours, for hours lost to reasons beyond the control of the employer, up to a total of 40 hours per week; hours in excess of 8 on Saturday shall then be paid at time and one-half the wage rate. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the wage rate. All hours on Sundays and holidays shall be paid at double the wage rate.

- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for hours lost to reasons beyond the control of the employer. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the wage rate.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Cement Mason

PREVAILING WAGE RATE

See " Bricklayer, Stone Mason" Rates

Craft: Cement Mason

COMMENTS/NOTES

See " Bricklayer, Stone Mason" Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Diver **PREVAILING WAGE RATE**

| | | |
|--------|----------------------------|--------------------------|
| | 07/03/19 | 05/01/20 |
| Diver | W52.14 B36.17 T88.31 | W0.00 B0.00 T89.81 |
| Tender | W43.45 B36.17 T79.62 | W0.00 B0.00 T81.12 |

Craft: Diver **APPRENTICE RATE SCHEDULE**

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|-------|-------|-------|--|--|--|--|--|--|
| 1500 hours | 70% | 75% | 80% | 85% | | | | | | |
| Benefits | 26.23 | 26.98 | 27.71 | 28.43 | | | | | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Diver **COMMENTS/NOTES**

OVERTIME:

- The first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 per day on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, the first 10 hours on Friday shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Dockbuilder PREVAILING WAGE RATE

| | 07/03/19 | 05/01/20 |
|------------|----------------------------|--------------------------|
| Foreman | W52.14 B36.17 T88.31 | W0.00 B0.00 T89.81 |
| Journeyman | W43.45 B36.17 T79.62 | W0.00 B0.00 T81.12 |

Craft: Dockbuilder APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|-------|-------|--|--|--|--|--|--|--|
| | 40% | 60% | 80% | | | | | | | |
| 1500 hours | | | | | | | | | | |
| Benefits | 21.78 | 24.75 | 27.71 | | | | | | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Dockbuilder COMMENTS/NOTES

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM ON OR AFTER 12-1-16:

| INTERVAL | PERIOD AND RATES | | | |
|------------|------------------|-------|-------|-------|
| 1500 hours | 40% | 50% | 65% | 80% |
| Benefits | 21.78 | 23.27 | 25.50 | 27.71 |

Creosote Handling:

- May 1st to Sept. 30th: + \$0.50 above hourly rate
- Oct. 1st to April 30th: + \$0.25 above hourly rate

Hazardous Material Work:

On hazardous material work on a state or federally designated hazardous work site where the worker is required to wear Level A, B or C personal protection, the worker shall receive an additional 20% of the hourly rate, per hour.

OVERTIME:

- The first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 per day on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, the first 10 hours on Friday shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Drywall Finisher

PREVAILING WAGE RATE

| | |
|-----------------|----------------------------|
| | 11/01/18 |
| Foreman | W43.95 B24.40 T68.35 |
| General Foreman | W45.94 B24.40 T70.34 |
| Journeyman | W39.95 B24.40 T64.35 |

Craft: Drywall Finisher

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|----------|-------|-----------|----------|-------|-----------|----------|-------|--|
| | 40% | 50% | | 60% | 70% | | 80% | 90% | | |
| 6 Months | | | | | | | | | | |
| Benefits | Intervals | 1 to 2 = | 10.65 | Intervals | 3 to 4 = | 13.17 | Intervals | 5 to 6 = | 16.25 | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Drywall Finisher

COMMENTS/NOTES

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- Shift work must run for a minimum of 5 consecutive workdays.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Electrician PREVAILING WAGE RATE

| | 09/30/19 |
|---|-----------------------------|
| Asst. General Foreman | W57.02 B50.82 T107.84 |
| Foreman | W53.22 B47.79 T101.01 |
| General Foreman | W61.78 B54.61 T116.39 |
| Journeyman, Cable Splicer | W47.52 B43.25 T90.77 |
| Lead Foreman | W54.65 B48.92 T103.57 |
| Working Foreman, Welder, Crane Operator (all types) | W49.90 B45.14 T95.04 |

Craft: Electrician APPRENTICE RATE SCHEDULE

| <u>INTERVAL</u> | <u>PERIOD AND RATES</u> | | | | | | | | | |
|-----------------|-------------------------|-------|-------|-------|-------|--|--|--|--|--|
| Yearly | 14.93 | 19.16 | 23.40 | 27.63 | 31.87 | | | | | |
| Benefits | 7.51 | 8.71 | 9.94 | 11.15 | 12.38 | | | | | |

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician COMMENTS/NOTES

- THESE RATES ALSO APPLY TO THE FOLLOWING:
- All fire and burglar alarm work.
 - All fiber optic work.
 - Teledata work in new construction (including additions).
 - Teledata work involving 16 or more instruments or voice/data lines.
 - All camera installations.

Height Work: 40 feet above ground/floor: +10% of the wage and benefit amount.

FOREMAN REQUIREMENTS (number of Electricians on site):
 (2 to 10) - a Working Foreman; (11 to 22) - a Foreman; (23 to 44) - a Lead Foreman; (35 to 48) - an Assistant General Foreman; (49 or more) - a General Foreman.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for a minimum of 5 consecutive workdays
- 2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

OVERTIME:

The first 4 hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and the first 8 hours on Saturdays, shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 12 per day, Monday through Friday, in excess of 8 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Electrician - Teledata (15 Voice/Data Lines & Less)

PREVAILING WAGE RATE

| | 01/01/19 | 01/01/20 |
|--|----------------------------|----------------------------|
| Master Technician/Gen. Foreman (31+ Workers on Job) | W48.59 B34.67 T83.26 | W49.26 B35.46 T84.72 |
| Senior Technician/Lead Foreman (21-30 Workers on Job) | W44.01 B33.20 T77.21 | W44.67 B34.01 T78.68 |
| Technician A/Foreman (11-20 Workers on Job) | W41.89 B32.52 T74.41 | W42.54 B33.33 T75.87 |
| Technician B/Working Foreman (4-10 Workers on Job) | W40.64 B31.11 T71.75 | W41.28 B31.93 T73.21 |
| Technician C/Journeyman (1-3 Workers on Job) | W36.73 B28.86 T65.59 | W37.36 B29.68 T67.04 |

Craft: Electrician - Teledata (15 Voice/Data Lines & Less)

APPRENTICE RATE SCHEDULE

| <u>INTERVAL</u> | <u>PERIOD AND RATES</u> | | | | | | | | | |
|-----------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|--|--|
| 6 Months | 17.26 | 17.26 | 20.54 | 20.54 | 25.48 | 25.48 | 30.02 | 30.02 | | |
| Benefits | 9.45 | 9.45 | 10.42 | 10.42 | 12.37 | 12.37 | 14.72 | 14.72 | | |

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician - Teledata (15 Voice/Data Lines & Less)

COMMENTS/NOTES

NOTES: These rates are for service, maintenance, moves and/or changes affecting 15 voice/data lines or less. These rates may NOT be used for any new construction or fiber optic work.

FOREMAN REQUIREMENTS:

The number of workers on the jobsite is the determining factor for which Foreman category applies.

HIGH WORK: Any work performed 40 feet above ground or floor: +10% of the wage and benefit amount.

SHIFT DIFFERENTIAL:

- 2nd Shift (4:30 PM to 12:30 AM) - 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM) - 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

OVERTIME:

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Electrician - Teledata (16 Instruments & More)

PREVAILING WAGE RATE

See "Electrician" Rates

Craft: Electrician - Teledata (16 Instruments & More)

COMMENTS/NOTES

See ELECTRICIAN Rates

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Electrician- Outside Commercial

PREVAILING WAGE RATE

| | 09/30/19 |
|--|-----------------------------|
| Assistant General Foreman | W57.02 B50.60 T107.62 |
| Foreman | W53.22 B47.54 T100.76 |
| General Foreman | W61.78 B54.42 T116.20 |
| Groundhand, Truck Driver, Conduit Installer (1 year or more experience) | W23.76 B23.83 T47.59 |
| Groundhand, Truck Driver, Conduit Installer (2 years or more experience) | W33.26 B31.48 T64.74 |
| Groundhand, Truck Driver, Conduit Installer (3 years or more experience) | W40.39 B37.20 T77.59 |
| Groundhand, Truck Driver, Conduit Installer (less than 1 year exp.) | W19.01 B1.02 T20.03 |
| Journeyman Lineman | W47.52 B42.96 T90.48 |
| Lead Foreman | W54.65 B48.68 T103.33 |
| Working Foreman | W49.90 B44.86 T94.76 |

Craft: Electrician- Outside Commercial

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|-------|-------|-------|--|--|--|
| 6 Months | 25.77 | 27.88 | 30.00 | 32.12 | 34.24 | 36.36 | 38.47 | | | |
| Benefits | 10.31 | 10.94 | 11.57 | 12.18 | 12.82 | 13.43 | 14.06 | | | |

Craft: Electrician- Outside Commercial

COMMENTS/NOTES

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

* FOR UTILITY WORK PLEASE SEE STATEWIDE RATES

FOREMAN REQUIREMENTS (number of Electricians on site):

(1 to 10)- one Working Foreman.

(11 to 20)- one Working Foreman and one Foreman.

(21 to 30)- one Working Foreman, one Foreman and one Lead Foreman.

(31 to 40) - one Working Foreman, two (2) Foremen and one Lead Foreman.

(41 to 50)- one Working Foreman, four (4) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman.

(51 to 60)- one Working Foreman, five (5) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman

(runs one foreman).

(61 to 70)- one Working Foreman, six (6) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman

(runs two foremen).

(71 to 80)- one Working Foreman, seven (7) Foremen, two (2) Assistant General Foremen and one General Foreman.

(81 to 90)- one Working Foreman, eight (8) Foremen, two (2) Assistant General Foremen, and one General Foreman.

(91 to 100)- one Working Foreman, nine (9) Foremen, two (2) Assistant General Foremen and one General Foreman.

The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

Shift work must run for a minimum of 5 consecutive workdays.

2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of wage rate, inclusive of benefits.

3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

OVERTIME:

All hours in excess of 8 per day, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and Holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS:

New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Electrician-Utility Work (North)

PREVAILING WAGE RATE

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (North)

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|--------|------|------|------|---------|-----------|--|--|--|
| * 6 Months | 60% | 65% | 70% | 75% | 80% | 85% | 90% | | | |
| Benefits | 69% of | Appren | tice | Wage | Rate | for all | intervals | | | |

Craft: Electrician-Utility Work (North)

COMMENTS/NOTES

Electrician-Utility Work (North) rates are located in the "Statewide" rate package.

* The apprentice wage rate is paid at the percentage of the Journeyman Lineman wage rate located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Electrician-Utility Work (South)

PREVAILING WAGE RATE

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (South)

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|-------|-------|-------|--|--|--|
| 6 Months | 28.53 | 30.91 | 33.29 | 35.66 | 38.04 | 40.42 | 42.80 | | | |
| Benefits | 25.01 | 26.41 | 27.83 | 29.24 | 30.65 | 32.05 | 33.47 | | | |

Craft: Electrician-Utility Work (South)

COMMENTS/NOTES

APPRENTICE RATE SCHEDULE AS OF 12-1-19:

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|-------|-------|-------|--|--|--|
| 6 Months | 29.11 | 31.54 | 33.96 | 36.39 | 38.82 | 41.24 | 43.67 | | | |
| Benefits | 25.61 | 27.04 | 28.46 | 29.90 | 31.33 | 32.79 | 34.23 | | | |

Electrician-Utility Work (South) rates are located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Elevator Constructor

PREVAILING WAGE RATE

| | 01/01/19 | 01/01/20 |
|--|-----------------------------|-----------------------------|
| Helper over 5 years | W40.28 B37.34 T77.62 | W41.61 B38.56 T80.17 |
| Helper under 5 years | W40.28 B36.53 T76.81 | W41.61 B37.73 T79.34 |
| Mechanic (Journeyman) over 5 years | W57.55 B38.72 T96.27 | W59.44 B39.99 T99.43 |
| Mechanic (Journeyman) under 5 years | W57.55 B37.57 T95.12 | W59.44 B38.80 T98.24 |
| Mechanic in Charge (Foreman) over 5 years | W64.74 B39.29 T104.03 | W66.87 B40.58 T107.45 |
| Mechanic in Charge (Foreman) under 5 years | W64.74 B38.00 T102.74 | W66.87 B39.25 T106.12 |
| Probationary Helper (1st 6 months) | W28.78 B35.84 T64.62 | W29.72 B37.02 T66.74 |

Craft: Elevator Constructor

APPRENTICE RATE SCHEDULE

| <u>INTERVAL</u> | <u>PERIOD AND RATES</u> | | | | | | | | | |
|-----------------|-------------------------|----------------|---------|----------|-----|-----------|--|--|--|--|
| Yearly | 55% | 65% | 70% | 80% | | | | | | |
| Benefits | full | journeyma n | benefit | rate for | all | intervals | | | | |

Ratio of Apprentices to Journeymen - *

* Total number of helpers and apprentices shall not exceed the number of mechanics on the job , except where 2 teams are working, 1 additional helper or apprentice may be employed for first 2 teams and an extra helper or apprentice for each additional 3 teams. Further, the employer may use as many helpers or apprentices as needed under the direction of a mechanic in wrecking old plants, handling and hoisting material, and on foundation work. When replacing cables on existing elevators, employer may use 2 helpers or apprentices to 1 mechanic.

Craft: Elevator Constructor

COMMENTS/NOTES

SHIFT DIFFERENTIALS:

- 2nd Shift (4:30 PM to 12:30 AM) shall be established on the basis of 7.5 hours of work for 8 hours of pay, plus an additional 10% per hour.
- 3rd Shift (12:30 AM to 8:00 AM) shall be established on the basis of 7 hours of work for 8 hours of pay, plus an additional 15% per hour.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday to Thursday or Tuesday to Friday, at straight time. When working a 4-10 hour day schedule, all hours worked on a day other than the days established for the 4-10 hour schedule shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and day after, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Glazier PREVAILING WAGE RATE

| | |
|------------|----------------------------|
| | 06/05/19 |
| Foreman | W47.37 B33.38 T80.75 |
| Journeyman | W43.87 B33.38 T77.25 |

Craft: Glazier APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|--|--|--|--|--|--|
| Yearly | 18.80 | 23.15 | 28.25 | 35.50 | | | | | | |
| Benefits | 17.69 | 19.54 | 20.71 | 22.68 | | | | | | |

Ratio of Apprentices to Journeymen - 1:3

Craft: Glazier COMMENTS/NOTES

HIGH WORK (30 feet above ground /floor or using a swing stage): +\$1.00/hr

FOREMAN REQUIREMENT:

- When 4 or more Glaziers are working on a job that runs for 10 days or more, 1 shall be designated a Foreman.

The regular workday shall be 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Second and Third shift shall receive the regular hourly rate, plus 15% per hour.

OVERTIME:

- The first 2 hours in excess of 8 per day (9th and 10th hours), or outside the regular workday, Monday through Friday, that are not shift work, and the first 8 hours on Saturdays shall be paid at time and one-half the regular rate. All other daily overtime, and all hours on Sundays and holidays shall be paid at double the regular rate.

- Four 10-hour days may be worked at straight time, Monday through Friday. The 11th and 12th hours on the 4 days worked, and the first 12 hours on the fifth day shall be paid at time and one-half the regular rate. All other daily overtime, and all hours on Saturdays, Sundays, and holidays shall be paid at double the regular rate.

- Benefits on overtime hours are as follows:

Time and one-half = \$41.04/hr.

Double time = \$48.70/hr.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Heat & Frost Insulator

PREVAILING WAGE RATE

| | 07/08/19 | 07/01/20 |
|------------|----------|----------|
| Foreman | W47.62 | W0.00 |
| | B36.13 | B0.00 |
| | T83.75 | T87.00 |
| Journeyman | W46.12 | W0.00 |
| | B36.13 | B0.00 |
| | T82.25 | T85.50 |

Craft: Heat & Frost Insulator

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-----|-----|-----------|-----|-----|--|--|--|--|
| | Yearly | 45% | 55% | 65% | 75% | 80% | | | | |
| Benefit | 32.88 | for | all | intervals | | | | | | |

Ratio of Apprentices to Journeymen - *

* Ratio = 1:4 on a "company-wide" basis (i.e. the total number of apprentices and journeymen employed by the company). There is no limit to the number of apprentices allowed on any one job, provided there is at least 1 journeyman on the job.

Craft: Heat & Frost Insulator

COMMENTS/NOTES

FOREMAN REQUIREMENTS:

- If there is only 1 Insulator on the job, he must be designated a Foreman.
- If there are 2 to 10 Insulators on the job, 1 must be designated a Foreman.
- If there are 11 or more Insulators on the job, 1 must be designated a General Foreman and receive the following additional pay (% above Journeyman wage rate):
 - 11 - 20 Insulators on site: 10%; 21 - 30 Insulators on site: 15%;
 - 31 - 40 Insulators on site: 20%; 41 - 50 Insulators on site: 25%

The regular workday shall be 8 hours between 7:00 AM and 3:30 PM.

SHIFT DIFFERENTIALS

- Shift work must run for a minimum of two (2) consecutive days and a minimum of two (2) shifts per day must be worked. Additionally, no less than two (2) employees may work on any one (1) shift. If these requirements are not met then shift work would not apply and the applicable overtime rate shall be paid.
- 1st Shift- Monday through Friday (7:00 AM- 3:00 PM).
- 2nd Shift- Monday through Friday (3:00 PM - 11:00 PM): additional 15% of the regular rate, inclusive of benefits.
- 3rd Shift- Monday through Friday (11:00 PM - 7:00 AM): additional 20% of the regular rate, inclusive of benefits.
- When a single night shift is established by the project owner for work not accessible during the day (due to the building being occupied), Monday through Friday, work performed during a second shift (3:00 PM-11:00 PM) shall be paid an additional 20% of the regular rate, inclusive of benefits, and work performed during a third shift (11:00 PM-7:00 AM) shall be paid an additional 25% of the regular rate, inclusive of benefits.

OVERTIME:

- Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, that are not shift work, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veteran's Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Heat & Frost Insulator - Asbestos Worker

PREVAILING WAGE RATE

| | 07/08/19 | 07/01/20 |
|------------|----------|----------|
| Foreman | W47.62 | W0.00 |
| | B36.13 | B0.00 |
| | T83.75 | T87.00 |
| Journeyman | W46.12 | W0.00 |
| | B36.13 | B0.00 |
| | T82.25 | T85.50 |

Craft: Heat & Frost Insulator - Asbestos Worker

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|--------|-------|-----------|--|--|--|--|--|--|
| | SEE | Heat & | Frost | Insulator | | | | | | |
| | | | | | | | | | | |

Craft: Heat & Frost Insulator - Asbestos Worker

COMMENTS/NOTES

NOTE: These rates apply only to the REMOVAL of insulation materials/asbestos from mechanical systems, including containment erection and demolition, and placing material in appropriate containers.

FOREMAN REQUIREMENTS:

- If there is only 1 Asbestos Worker on the job, he must be designated an Abatement Foreman.
- If there are 2 to 10 Asbestos Workers on the job, 1 must be designated an Abatement Foreman.
- If there are 11 or more Asbestos Workers on the job, 1 must be designated a General Foreman and receive the following additional pay (% above Abatement Mechanic wage rate):
 - 11 - 20 Insulators on site: 10%; 21 - 30 Insulators on site: 15%;
 - 31 - 40 Insulators on site: 20%; 41 - 50 Insulators on site: 25%

MECHANIC-TO-APPRENTICE RATIO:

- Maximum of 5 Apprentices for each Abatement Mechanic on the job.

OVERTIME:

- Hours in excess of 8 per day, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veteran's Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Ironworker

PREVAILING WAGE RATE

| | 12/09/19 | 07/01/20 |
|--------------------------------|----------------------------|----------------------------|
| Foreman-Fence and Guardrail | W53.54 B30.79 T84.33 | W53.54 B31.04 T84.58 |
| Foreman-Rod/Mesh | W54.62 B30.79 T85.41 | W54.62 B31.04 T85.66 |
| Foreman-Structural | W55.70 B30.79 T86.49 | W55.70 B31.04 T86.74 |
| Journeyman-Fence and Guardrail | W49.57 B30.79 T80.36 | W49.57 B31.04 T80.61 |
| Journeyman-Rod/Mesh | W50.57 B30.79 T81.36 | W50.57 B31.04 T81.61 |
| Journeyman-Structural | W51.57 B30.79 T82.36 | W51.57 B31.04 T82.61 |

Craft: Ironworker

APPRENTICE RATE SCHEDULE

| <u>INTERVAL</u> | <u>PERIOD AND RATES</u> | | | | | | | | | |
|-----------------|-------------------------|-----|-----|--|--|--|--|--|--|--|
| Yearly | 60% | 75% | 85% | | | | | | | |
| | | | | | | | | | | |

Ratio of Apprentices to Journeymen - *

* On all work EXCEPT Ornamental Iron and Bridge Cable Spinning Work 1:4; On Ornamental Iron and Bridge Cable Spinning Work 1:1.

Craft: Ironworker

COMMENTS/NOTES

Note: For work on hazardous waste sites, workers shall receive an additional \$3.00 per hour.

The regular workday shall consist of 8 hours between 7:00 AM and 5:00 PM.

SHIFT DIFFERENTIALS:

- Second shift shall receive an additional 10% per hour.
- Third shift shall receive an additional 15% per hour.

OVERTIME:

- Time and one-half the wage rate for hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and for all hours on Saturdays. Double the wage rate for all hours on Sundays and holidays.
- Employees may work four 10-hour days, Monday to Thursday, at straight time. Friday may be used as a make-up day

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

for a day lost to inclement weather. If Friday is not a make-up day, all hours worked on Friday shall be paid at time and one-half the wage rate.

- Benefits on overtime hours shall be paid at the following rates:

When wages are time and one-half, benefits = \$35.06.

When wages are double, benefits = \$39.33.

- As of 7-1-20, benefits on overtime hours shall be paid at the following rates:

When wages are time and one-half, benefits = \$35.31.

When wages are double, benefits = \$39.58.

RECOGNIZED HOLIDAYS: New Year's Eve, New Year's Day, Memorial Day, July 4th, Labor Day, General and Presidential Election Day, Thanksgiving Day, Christmas Eve, Christmas Day. Saturday holidays observed the preceding Friday. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Laborer - Asbestos & Hazardous Waste Removal

PREVAILING WAGE RATE

| | |
|----------------------|----------------------------|
| | 10/24/19 |
| Journeyman (Handler) | W32.48 B22.81 T55.29 |

Craft: Laborer - Asbestos & Hazardous Waste Removal

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-----------|--|--|--|--|--|--|
| Yearly | 19.49 | 22.74 | 25.98 | 29.23 | | | | | | |
| Benefit | 21.16 | for | all | intervals | | | | | | |

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than one (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Asbestos & Hazardous Waste Removal

COMMENTS/NOTES

NOTE: These rates apply to work in connection with Asbestos, Radiation, Hazardous Waste, Lead, Chemical, Biological, Mold Remediation and Abatement.

The regular workday shall be 8 hours.

OVERTIME:

- Hours in excess of 8 per day, Monday through Saturday, and all hours on Sunday and holidays shall be paid at time and one-half the regular rate.
- Benefits on ALL overtime hours shall be paid at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Good Friday, Easter, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. (Holidays start at 12:00 am).

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

on the basis of 8 hours pay for 7 hours worked. The day shift shall receive the regular rate, the second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.

- When a second or third shift is worked with no day shift, the second or third shift shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.

OVERTIME:

- Hours in excess of 8 per day, or outside the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. Saturday may be used as a make-up day (paid at straight time) for a day lost to inclement weather, or for a holiday that is observed during the work week, Monday through Friday. All hours on Sundays and holidays shall be paid at double the regular rate.

- Four 10-hour days may be worked Monday to Thursday, at straight time, with Friday used a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the regular rate.

- Benefits on ALL overtime hours shall be paid at time and one-half.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Laborer - Heavy & General

PREVAILING WAGE RATE

Rates are located in the
"Statewide" rate package

Craft: Laborer - Heavy & General

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|-----|-----|-----------|--|--|--|--|--|--|
| 1000 Hours | 60% | 70% | 80% | 90% | | | | | | |
| Benefits | 21.03 | for | all | intervals | | | | | | |

Ratio of Apprentices to Journeymen - *

* No more than 1 apprentice for the first journeyman and no more than 1 apprentice for each additional 3 journeymen.

Craft: Laborer - Heavy & General

COMMENTS/NOTES

As of 3-1-20, benefits shall be \$21.78.

Heavy & General Laborer rates are located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Laborer-Residential and Modular Construction

PREVAILING WAGE RATE

| | 05/03/19 | 04/01/20 |
|--|---------------------------|---------------------------|
| * Skilled Tradesman (only applies to Modular Construction) | W26.20 B5.45 T31.65 | W26.55 B5.45 T32.00 |
| Foreman (person directing crew, regardless of his skill classification) | W30.20 B5.45 T35.65 | W30.55 B5.45 T36.00 |
| Laborer | W22.20 B5.45 T27.65 | W22.55 B5.45 T28.00 |
| Laborer (for single family and stand-alone duplex owned by single owner) | W16.70 B2.95 T19.65 | W17.05 B2.95 T20.00 |

Craft: Laborer-Residential and Modular Construction

APPRENTICE RATE SCHEDULE

| <u>INTERVAL</u> | <u>PERIOD AND RATES</u> | | | | | | | | | |
|-----------------|-------------------------|-----------|-----------|-----------|--|--|--|--|--|--|
| | As shown | 800 hours | 600 hours | 600 hours | | | | | | |
| wage & benefits | 70% | 80% | 90% | | | | | | | |

Ratio of Apprentices to Journeymen-

One (1) apprentice shall be allowed for the first journeyman on site and no more than one (1) additional apprentice for each additional three (3) journeymen on site.

Craft: Laborer-Residential and Modular Construction

COMMENTS/NOTES

* SKILLED TRADESMAN- any worker doing work not typically done by a Building Laborer. Some examples are installing interior doors, sheet rock, hooking up appliances, installing light fixtures, installing railing systems, etc. Please note where local building codes require that certain work be performed under the supervision of a licensed tradesman (i.e. Plumber, Electrician, etc.) Laborers shall work under such supervision.

RESIDENTIAL CONSTRUCTION- All residential construction (not commercial), single-family, stand-alone duplex houses, townhouses and multi-family buildings of not more than four (4) floors. Each housing unit must be fully and independently functional; each housing unit must have its own kitchen and bathroom. The definition includes all incidental items such as site work, parking areas, utilities, streets and sidewalks. Please note the construction must be Residential in nature. A First Floor at or below grade may contain commercial space not to exceed 50% square footage of the floor; at least 50% of the First Floor must contain living accommodations or related nonresidential uses (e.g. laundry space, recreation/hobby rooms, and/or corridor space). Basement stories below grade used for storage, parking, mechanical systems/equipment, etc., are considered basement stories which are not used in determining the building's height. An attic is an unfinished space located immediately below the roof. Such space is not used in determining a building's height even if used for storage purposes. In addition, barracks and dormitories are not considered residential projects.

MODULAR RESIDENTIAL CONSTRUCTION- all aspects of modular residential construction (not commercial) at the site of installation of structures of no more than four (4) stories, including all excavation and site preparation, footings and

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

foundation systems whether poured on-site or prefabricated, all underground waterproofing, underground utilities, concrete slabs, sidewalks, driveways, paving, hardscape and landscaping. Please note the construction must be Residential as defined above. All work performed by the Set Crew (the crew of workers who set the modular boxes on the foundation), including the rigging, setting, attaching and assembly of all modules and structural members, preparation of the foundation to accept modules, such as sill plates, connection of all in-module and under-module connections including, but not limited to, plumbing, electrical, HVAC, fire suppression, CATS, telephone, television/internet, and fiber optic, the building or installation of any porches or decks regardless of material or method of construction, the on-site installation of, or completion of any roof system, doors, windows and fenestrations, including flashing, gutter and soffit systems, waterproofing, insulation and interior and exterior trim work, and painting. Please note that modular construction does not include on-site stick built construction, tip up construction or panel built construction.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

OVERTIME:

Hours worked in excess of 8 per day/40 per week, Monday through Saturday, and all hours worked on Sunday and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOILDAYS:

New Year's Day, Martin Luther King Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Millwright

PREVAILING WAGE RATE

| | |
|------------|----------------------------|
| | 05/01/19 |
| Foreman | W58.26 B34.39 T92.65 |
| Journeyman | W50.66 B29.99 T80.65 |

Craft: Millwright

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|--------|------|------|------|---------|-----------|---------|-----|-----|
| 6 Months | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 85% | 95% |
| Benefits | 58% of | Appren | tice | Wage | Rate | for all | intervals | + \$.60 | | |

Ratio of Apprentices to Journeymen - 1:3

Craft: Millwright

COMMENTS/NOTES

FOREMAN REQUIREMENTS:

- When there are 2 or more Millwrights on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Millwrights on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:

- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:

- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Operating Engineer - Field Engineer

PREVAILING WAGE RATE

Rates are located in the
"Statewide" rate package

Craft: Operating Engineer - Field Engineer

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-----|---------|----------|----------|------------|-----|------|--|--|
| Yearly | 70% | 75% | of Rod/ | Chainman | Wage | | | | | |
| Yearly | | | 80% | 90% | Transit/ | Instrument | man | Wage | | |

Ratio of Apprentices to Journeymen - *

* No more than 1 Field Engineer Apprentice per Survey Crew.

Craft: Operating Engineer - Field Engineer

COMMENTS/NOTES

Operating Engineer - Field Engineer rates are located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Painter - Bridges

PREVAILING WAGE RATE

| | |
|-----------------|----------------------------|
| | 05/03/19 |
| Foreman | W59.81 B28.74 T88.55 |
| General Foreman | W61.81 B28.74 T90.55 |
| Journeyman | W54.81 B28.74 T83.55 |

Craft: Painter - Bridges

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|----------|-------|-----------|----------|-------|-----------|----------|-------|--|
| | 40% | 50% | | | 60% | 70% | | 80% | 90% | |
| 6 Months | | | | | | | | | | |
| Benefits | Intervals | 1 to 2 = | 10.00 | Intervals | 3 to 4 = | 12.27 | Intervals | 5 to 6 = | 15.28 | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Painter - Bridges

COMMENTS/NOTES

These rates apply to: All bridges that span waterways, roadways, railways and canyons. All tunnels, overpasses, viaducts and all appurtenances.

FOREMEN REQUIREMENTS:

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Painter - Line Striping

PREVAILING WAGE RATE

| | 05/03/19 |
|---|----------------------------|
| Apprentice (1st year) | W26.44 B11.65 T38.09 |
| Apprentice (2nd year) | W30.44 B19.16 T49.60 |
| Foreman (Charge Person) | W39.09 B19.94 T59.03 |
| Journeyman 1 (at least 1 year of working exp. as a journeyman) | W34.32 B19.94 T54.26 |
| Journeyman 2 (at least 2 years of working exp. as a journeyman) | W38.09 B19.94 T58.03 |

Craft: Painter - Line Striping

COMMENTS/NOTES

OVERTIME:

Hours in excess of 8 per day, Monday through Saturday, and all hours on Sundays and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day. Veterans Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Painter - New Construction

PREVAILING WAGE RATE

| | 05/01/19 | 05/01/20 |
|-----------------|----------------------------|----------------------------|
| Foreman | W45.45 B24.35 T69.80 | W47.45 B24.35 T71.80 |
| General Foreman | W49.43 B24.67 T74.10 | W51.43 B24.67 T76.10 |
| Journeyman | W41.47 B24.04 T65.51 | W43.47 B24.04 T67.51 |

Craft: Painter - New Construction

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|------|-------|-------|-------|-------|-------|-------|--|--|
| | 40% | 45% | 55% | 65% | 70% | 75% | 80% | 80% | | |
| 6 Months | | | | | | | | | | |
| Benefits | 8.05 | 8.05 | 10.05 | 10.05 | 11.05 | 11.05 | 14.05 | 14.05 | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Painter - New Construction

COMMENTS/NOTES

Spraying, sandblasting, lead abatement, work on tanks or stacks, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

FOREMEN REQUIREMENTS:

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Painter - Repainting

PREVAILING WAGE RATE

| | 05/01/19 | 05/01/20 |
|-----------------|----------------------------|----------------------------|
| Foreman | W33.07 B19.95 T53.02 | W33.92 B19.95 T53.87 |
| General Foreman | W36.00 B20.10 T56.10 | W36.85 B20.10 T56.95 |
| Journeyman | W30.14 B19.77 T49.91 | W30.99 B19.77 T50.76 |

Craft: Painter - Repainting

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|---------|-----|--------------|------|--|--|--|--|--|
| | SEE | PAINTER | NEW | CONSTR UC | TION | | | | | |
| | | | | | | | | | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Painter - Repainting

COMMENTS/NOTES

NOTE: These rates may only be used on jobs where no major alterations (only doing painting and carpeting with nothing else being changed in the office or on the project) occur, and where not more than 3 other trades are present on the job, but may NOT, under any circumstances, be used for work on bridges, stacks, elevated tank, or generating stations.

Spraying, sandblasting, lead abatement, work on tanks or stacks, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

FOREMEN REQUIREMENTS:

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

OVERTIME:

- Hours in excess of 8 per day and 40 per week shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Four 10-hour days may be worked, at straight time, Monday through Sunday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Painter- Containment

PREVAILING WAGE RATE

| | |
|------------|----------------------------|
| | 05/04/17 |
| Journeyman | W35.18 B24.75 T59.93 |

Craft: Painter- Containment

COMMENTS/NOTES

NOTE: These rates shall require no painting, but used in a supporting capacity only, such as wrapping, boxing, fencing, etc. on tanks.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate..

- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Painter-Elevated Water Tanks

PREVAILING WAGE RATE

| | |
|-----------------|----------------------------|
| | 05/04/17 |
| Foreman | W48.92 B24.92 T73.84 |
| General Foreman | W50.92 B24.92 T75.84 |
| Journeyman | W43.92 B24.92 T68.84 |

Craft: Painter-Elevated Water Tanks

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|---------|---------|--|--|--|--|--|--|--|
| | SEE | PAINTER | BRIDGES | | | | | | | |
| | | | | | | | | | | |

Craft: Painter-Elevated Water Tanks

COMMENTS/NOTES

These rates apply to: All new and repaint elevated water tanks (interior and exterior).

FOREMEN REQUIREMENTS:

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Painter-Structural Steel

PREVAILING WAGE RATE

| | |
|-----------------|----------------------------|
| | 05/04/17 |
| Foreman | W47.87 B25.27 T73.14 |
| General Foreman | W49.87 B25.27 T75.14 |
| Journeyman | W42.87 B25.27 T68.14 |

Craft: Painter-Structural Steel

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|---------|---------|--|--|--|--|--|--|--|
| | SEE | PAINTER | BRIDGES | | | | | | | |
| | | | | | | | | | | |

Craft: Painter-Structural Steel

COMMENTS/NOTES

These rates apply to: All work in power plants (any aspect). On steeples, on dams, on hangers, transformers, substations, etc. and on open steel, whether new or repaint. All new work (excluding traditional commercial painting work) in refineries, tank farms, water/sewerage treatment facilities and on pipelines.

FOREMEN REQUIREMENTS:

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Paperhanger - New Construction

PREVAILING WAGE RATE

| | 05/01/19 | 05/01/20 |
|------------|----------------------------|----------------------------|
| Foreman | W46.75 B24.11 T70.86 | W47.68 B24.11 T71.79 |
| Journeyman | W41.68 B24.11 T65.79 | W42.61 B24.11 T66.72 |

Craft: Paperhanger - New Construction

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|---------|-----|--------|------|--|--|--|--|--|
| | SEE | PAINTER | NEW | CONSTR | TION | | | | | |
| | | | | UC | | | | | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Paperhanger - New Construction

COMMENTS/NOTES

FOREMEN REQUIREMENTS:

- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.

- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.

- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Paperhanger - Renovation

PREVAILING WAGE RATE

| | 05/01/19 | 05/01/20 |
|------------|----------------------------|----------------------------|
| Foreman | W34.13 B19.81 T53.94 | W35.15 B19.81 T54.96 |
| Journeyman | W31.03 B19.81 T50.84 | W31.96 B19.81 T51.77 |

Craft: Paperhanger - Renovation

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-----|---------|-----|--------|------|--|--|--|--|
| | | SEE | PAINTER | NEW | CONSTR | TION | | | | |
| | | | | | UC | | | | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Paperhanger - Renovation

COMMENTS/NOTES

NOTE: These rates may only be used on jobs where no major alterations occur, and where not more than 3 other trades are present on the job, but may NOT, under any circumstances, be used for work on bridges, stacks, elevated tanks, or generating stations.

FOREMEN REQUIREMENTS:

- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

OVERTIME:

- Hours in excess of 8 per day and 40 per week shall be paid at time and one-half the regular rate.
- Four 10-hour days may be worked, at straight time, Monday through Sunday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Pipefitter

PREVAILING WAGE RATE

See "Plumber" Rates

Craft: Pipefitter

COMMENTS/NOTES

*** See PLUMBER Rates***

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Plasterer

PREVAILING WAGE RATE

See "Cement Mason" Rates

Craft: Plasterer

COMMENTS/NOTES

See CEMENT MASON Rates

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Plumber PREVAILING WAGE RATE

| | |
|------------|----------------------------|
| | 05/01/19 |
| Foreman | W49.25 B45.29 T94.54 |
| Journeyman | W44.77 B45.29 T90.06 |

Craft: Plumber APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 6 Months | 35% | 40% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |
| Benefits | 27.98 | 29.25 | 31.78 | 33.03 | 34.28 | 35.54 | 36.82 | 38.07 | 39.34 | 40.59 |

Ratio of Apprentices to Journeymen - 1:4

Craft: Plumber COMMENTS/NOTES

FOREMAN REQUIREMENTS:

- On any job having 2 or more Journeyman Plumbers, 1 must be designated a Foreman.
- There must be 1 additional Foreman for every 10 Plumbers on the job.

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for a minimum of 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive 8 hours pay for 8 hours of work.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- The rate of pay for all shift work shall be an additional 15% of the hourly rate, per hour.

OVERTIME:

The first 4 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and the first 12 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 12 per day, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Roofer PREVAILING WAGE RATE

| | |
|--------------------------------|----------------------------|
| | 07/01/19 |
| Foreman (5 workers or less) | W40.35 B31.80 T72.15 |
| Foreman (6 workers or more) | W40.85 B31.80 T72.65 |
| Journeyman | W38.35 B31.80 T70.15 |

Craft: Roofer APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|--|--|--|--|--|--|
| Yearly | 52% | 55% | 60% | 75% | | | | | | |
| Benefits | 22.32 | 25.07 | 31.80 | 31.80 | | | | | | |

Ratio of Apprentices to Journeymen - *

* 1:2, 2:4, 3:6, 4:8, 5:10, 6:12, 7:14

Craft: Roofer COMMENTS/NOTES

NOTE: Mopper, Operator of Felt Laying Machine or Slag Dispenser shall receive an additional \$.50 per hour.

FOREMAN REQUIREMENTS:

- There must be a Foreman on all jobs.
- Foreman rate depends on the number of Roofers on the job, as indicated.

The regular workday is 8 hours between 5:00 AM and 4:30 PM.

OVERTIME:

Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Roofer - Shingle, Slate & Tile

PREVAILING WAGE RATE

| | |
|--------------------------------|----------------------------|
| | 07/01/19 |
| Foreman (3 workers or less) | W28.75 B20.87 T49.62 |
| Foreman (4 workers or more) | W29.50 B20.87 T50.37 |
| Helper | W14.25 B20.87 T35.12 |
| Journeyman (shingle work) | W28.50 B20.87 T49.37 |

Craft: Roofer - Shingle, Slate & Tile

APPRENTICE RATE SCHEDULE

| <u>INTERVAL</u> | <u>PERIOD AND RATES</u> | | | | | | | | | |
|-----------------|-------------------------|-----|-----|--|--|--|--|--|--|--|
| Yearly | 60% | 70% | 80% | | | | | | | |
| | | | | | | | | | | |

Ratio of Apprentices to Journeymen - *

* 1:2, 2:4, 3:6, 4:8, 5:10, 6:12, 7:14

Craft: Roofer - Shingle, Slate & Tile

COMMENTS/NOTES

NOTE: Above rates are for Shingle work only. Slate and Tile work rates are an additional \$3.00 per hour.

HELPER RATIO: 1 Helper to 1 Journeyman

FOREMAN REQUIREMENTS:

- There must be a Foreman on all jobs.
- Foreman rate depends on the number of Roofers on the job, as indicated.

OVERTIME:

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Sheet Metal Sign Installation

PREVAILING WAGE RATE

| | |
|------------|----------------------------|
| | 07/17/19 |
| Foreman | W29.50 B23.01 T52.51 |
| Journeyman | W27.50 B23.01 T50.51 |

Craft: Sheet Metal Sign Installation

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1000 Hours | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 90% |
| Benefits | 22.53 | 22.57 | 22.61 | 22.65 | 22.69 | 22.73 | 22.77 | 22.81 | 22.85 | 22.96 |

Ratio of Apprentices to Journeymen - 1:2

Craft: Sheet Metal Sign Installation

COMMENTS/NOTES

HAZARDOUS DUTY:

Sign Installers working from a bosun's chair or outside swinging scaffold at a height of 60 feet or more: + \$5.00 per hour.

FOREMAN REQUIREMENTS:

When there are 3 or more Sign Installers on a job, one must be designated a Foreman.

The regular workday shall be 8 hours, between 8:00 AM and 5:00 PM.

OVERTIME:

Hours in excess of 8 per day, or outside the regular workday, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at time and one-half the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Sheet Metal Worker

PREVAILING WAGE RATE

| | 06/01/19 | 06/01/20 |
|------------|----------------------------|--------------------------|
| Foreman | W52.89 B41.83 T94.72 | W0.00 B0.00 T98.22 |
| Journeyman | W49.89 B41.83 T91.72 | W0.00 B0.00 T95.22 |

Craft: Sheet Metal Worker

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|----------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 6 months | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |
| Benefits | 14.06 | 15.63 | 17.20 | 18.76 | 20.32 | 27.74 | 29.75 | 31.75 | 33.77 | 35.80 |

Ratio of Apprentices to Journeymen- 1:3, except for the following types of work where the ratio shall be 1:1 (architectural metal work, testing and balancing, lockers, shelving and toilet partitions).*

* For work performed in a fabrication shop, the ratio will be applied on a "company-wide" basis (i.e. the total number of apprentices and journeymen employed by the company).

Craft: Sheet Metal Worker

COMMENTS/NOTES

JOB SITE FOREMAN REQUIREMENTS:

- When there are 2 to 9 Sheet Metal Workers on a jobsite, 1 must be designated a Foreman.
- When there are 10 to 16 Sheet Metal Workers on a job site, 2 must be designated Foremen.
- When there are 17 to 23 Sheet Metal Workers on a job site, 3 must be designated Foremen.
- For every 7 additional Sheet Metal Workers on a job site, there shall be 1 additional Foreman.

SHOP FOREMAN REQUIREMENTS (For custom fabrication):

- When there are 1 to 10 Sheet Metal Workers in the shop, 1 must be designated a Foreman.
- For every 10 additional Sheet Metal Workers in the shop, 1 must be designated a Foreman.

The regular workday consists of 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for a minimum of 5 consecutive workdays.
- There must be a day shift worked in order to have a 2nd and/or 3rd Shift.
- Shop work does not satisfy shift requirements.
- 2nd Shift (4:30 PM-12:30 AM) shall be paid an additional 15% of the regular rate per hour inclusive of benefits, and receive 8 hours pay for 7.5 hours of work.
- 3rd Shift (12:30 AM-8:00 AM) shall be paid an additional 25% of the regular rate per hour inclusive of benefits, and receive 8 hours pay for 7 hours of work.

OVERTIME:

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday, shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.

- Benefits on overtime hours are as follows:

Time and one-half = \$48.17.

Double-time = \$55.19.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Sprinkler Fitter

PREVAILING WAGE RATE

| | |
|-----------------|----------------------------|
| | 04/04/19 |
| Foreman | W53.00 B26.26 T79.26 |
| General Foreman | W55.25 B26.26 T81.51 |
| Journeyman | W50.25 B26.26 T76.51 |

Craft: Sprinkler Fitter

APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|------------|------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1000 Hours | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% | 90% |
| Benefits | 8.52 | 8.52 | 18.29 | 18.29 | 18.54 | 18.54 | 18.54 | 18.54 | 18.54 | 18.54 |

Ratio of Apprentices to Journeymen - 1:1

Craft: Sprinkler Fitter

COMMENTS/NOTES

FOREMAN REQUIREMENTS:

- There must be a Foreman on all projects. If there is only 1 Sprinkler Fitter on the project, he/she shall be designated a Foreman.
- On any job with 22 or more Sprinkler Fitters 1 shall be designated a General Foreman.

The regular workday consists of 8 hours, between 6:00 AM and 6:00 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for a minimum of 5 consecutive workdays.
- 2nd and/or 3rd shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:

- Hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Tile Worker PREVAILING WAGE RATE

| | |
|----------|----------------------------|
| | 12/02/19 |
| Finisher | W41.15 B27.63 T68.78 |
| Setter | W47.79 B33.20 T80.99 |

Craft: Tile Worker APPRENTICE RATE SCHEDULE

| INTERVAL | PERIOD AND RATES | | | | | | | | | |
|-----------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 750 Hours | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 90% |
| | | | | | | | | | | |

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Worker COMMENTS/NOTES

NOTE: These rates also apply to Terrazzo and Marble work.

OVERTIME:

Hours in excess of 8 per day, Monday through Friday, and the first 10 hours on Saturdays shall be paid at time and one half the regular rate, inclusive of benefits. Hours in excess of 10 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS:

New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day. Sunday holidays shall be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Truck Driver

PREVAILING WAGE RATE

| | 05/03/19 | 05/01/20 |
|--|----------------------------|--------------------------|
| Bucket, Seeding/Fertilizing/ Mulching trucks | W38.45 B21.28 T59.73 | W0.00 B0.00 T61.73 |
| Concrete mobile unit; Tack Spreader, Transit Mix trucks | W38.45 B21.28 T59.73 | W0.00 B0.00 T61.73 |
| Dump, Tank, Pick-up, Vacuum or Vac-All trucks | W38.45 B21.28 T59.73 | W0.00 B0.00 T61.73 |
| Helper on Straight 3-axle truck, Mechanic's helper | W38.25 B21.28 T59.53 | W0.00 B0.00 T61.53 |
| Large, off-road dump or water truck | W38.80 B21.28 T60.08 | W0.00 B0.00 T62.08 |
| Mechanic | W38.95 B21.28 T60.23 | W0.00 B0.00 T62.23 |
| Shop Steward | W38.50 B21.28 T59.78 | W0.00 B0.00 T61.78 |
| Straight 3-axle truck | W38.45 B21.28 T59.73 | W0.00 B0.00 T61.73 |
| Tow Truck | W38.60 B21.28 T59.88 | W0.00 B0.00 T61.88 |
| Tractor Trailer; Fuel, Winch, Asphalt Oil Distributor trucks | W38.80 B21.28 T60.08 | W0.00 B0.00 T62.08 |

Craft: Truck Driver

COMMENTS/NOTES

HAZARDOUS WASTE WORK:

- On hazardous waste removal work on a State-designated hazardous waste site where the driver is in direct contact with hazardous materials and when personal protective equipment is required for respiratory, skin, and eye protection: + \$3.00 per hour.
- All other designated hazardous waste sites: + \$1.00 per hour.

SHIFT DIFFERENTIAL:

- Second shift shall receive an additional \$1.00 per hour.

OVERTIME:

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days at straight time, Monday through Thursday, with Friday used as a make-up day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. When all trades agree, the day after Thanksgiving may be substituted for Veterans' Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Truck Driver-Material Delivery Driver

PREVAILING WAGE RATE

| | 05/03/19 | 05/01/20 |
|--------|----------------------------|--------------------------|
| Driver | W38.45 B21.28 T59.73 | W0.00 B0.00 T61.73 |

Craft: Truck Driver-Material Delivery Driver

COMMENTS/NOTES

HAZARDOUS WASTE WORK:

- All designated hazardous waste sites: + \$1.00 per hour.

SHIFT DIFFERENTIAL:

- Second shift shall receive an additional \$1.00 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.

- Employees may work four 10-hour days at straight time, Monday through Thursday, with Friday used as a make-up day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. When all trades agree, the day after Thanksgiving may be substituted for Veterans' Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION**

County - ATLANTIC

Craft: Welder

PREVAILING WAGE RATE

Welder

Craft: Welder

COMMENTS/NOTES

Welders rate is the same as the craft to which the welding is incidental .



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
(In words, indicate day, month and year.)

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

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

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

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

Fraytak Veisz Hopkins Duthie, P.C.
1515 Lower Ferry Road
Trenton, NJ 08618

The Owner and Contractor agree as follows.

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.

Init.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

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 a Modification, 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.

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~~ Owner/Architect.
- 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 Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

Init.

(Check one of the following boxes and complete the necessary information.)

Not later than () calendar days from the date of commencement of the Work.

By the following date: as shown in specification section 01800

§ 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 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as 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.)

Liquidated damages to be assessed in accordance with Specification Section 01800 - Time of Completion and liquidated Damages.

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

Init.

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, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the fifteenth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the ~~day of the month~~. ~~If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than () days after the Architect receives the Application for Payment.~~ fifteenth day of the following month.

(Federal, state or local laws may require payment within a certain period of time.)

§ 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 In accordance with 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:

§ 5.1.6.1 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.

§ 5.1.6.2 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 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 AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 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.)

Init.

2% of the amount due on each partial payment shall be withheld by the board of education when the outstanding balance of the contract exceeds \$500,000, and 5% of the amount due on each partial payment shall be withheld when the outstanding balance of the contract is \$500,000 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.)

§ 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.)

5% of the amount due on each partial payment shall be withheld when the outstanding balance of the contract is \$500,000 or less.

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 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

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 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:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

%

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

Init.

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

- Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- Litigation in a ~~court of competent jurisdiction~~ NJ Court of Law
- Other (Specify)

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

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

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

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

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of 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.

(Name, address, email address, and other information)

(Name, address, email address, and other information)

Init.

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

~~§ 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 A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of 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 A condition of this Agreement is that the Contractor will comply with all applicable governmental laws and regulations including, but without limitation, those set forth in Section 00860 of the Specifications, which are hereby incorporated by reference as if set forth herein at length.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 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:~~

Init.

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User Notes:

(1448245040)

(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

| Number | Title | Date |
|--------|-------|------|
|--------|-------|------|

.6 Specifications

| Section | Title | Date | Pages |
|---------|-------|------|-------|
|---------|-------|------|-------|

.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.)

This Agreement entered into as of the day and year first written above.

Init.

OWNER *(Signature)*

CONTRACTOR *(Signature)*

(Printed name and title)

(Printed name and title)

Init.

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User Notes:

(1448245040)

AIA[®] Document A101[™] – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of in the year
(In words, indicate day, month and year.)

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE CONTRACTOR:
(Name, legal status and address)

TABLE OF ARTICLES

- A.1 GENERAL
- A.2 OWNER'S INSURANCE
- A.3 CONTRACTOR'S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201[™]-2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

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. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

This document is intended to be used in conjunction with AIA Document A201[™]-2017, General Conditions of the Contract for Construction. Article 11 of A201[™]-2017 contains additional insurance provisions.

Init.

§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project-as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

(Indicate below the cause of loss and any applicable sub-limit.)

| Causes of Loss | Sub-Limit |
|----------------|-----------|
|----------------|-----------|

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

| Coverage | Sub-Limit |
|----------|-----------|
|----------|-----------|

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.

The Owner shall purchase and maintain the insurance selected and described below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

- § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

- § A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

- § A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

- § A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

- § A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

- § A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

- § A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

- § A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach,

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including costs of investigating a potential or actual breach of confidential or private information.
(Indicate applicable limits of coverage or other conditions in the fill point below.)

[] § A.2.5.2 Other Insurance

(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage

Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than one million dollars (\$ 1,000,000.00) each occurrence, two million dollars (\$ 2,000,000.00) general aggregate, and two million (\$ 2,000,000.00) aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and

- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.
- .6 the policy shall name the Owner, Architect, Construction Manager and their Consultants, Agents and Employees as additional insured.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than one million dollars (\$ 1,000,000.00) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than five hundred thousand dollars (\$ 500,000.00) each accident, five hundred thousand dollars (\$ 500,000.00) each employee, and five hundred thousand dollars (\$ 500,000.00) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than (\$) per claim and (\$) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than (\$) per claim and (\$) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than (\$) per claim and (\$) in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than (\$) per claim and (\$) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than (\$) per claim and (\$) in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[] § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

[] § A.3.3.2.2 **Railroad Protective Liability Insurance**, with policy limits of not less than (\$) per claim and (\$) in the aggregate, for Work within fifty (50) feet of railroad property.

[] § A.3.3.2.3 **Asbestos Abatement Liability Insurance**, with policy limits of not less than (\$) per claim and (\$) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[] § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[] § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[] § A.3.3.2.6 **Other Insurance**
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Init.

Coverage

Limits

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:

(Specify type and penal sum of bonds.)

| Type | Penal Sum (\$0.00) |
|------------------|----------------------------------|
| Payment Bond | Amount equal to the Contract Sum |
| Performance Bond | Amount equal to the Contract Sum |

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

PART 1 - CONTRACT CONDITIONS AND GENERAL REQUIREMENTS

**SECTION 00700 - GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
AIA DOCUMENT A201 - 2017**

AIA[®] Document A201[™] – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, and address)

THE ARCHITECT:
(Name, and address)

TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 OWNER
- 3 CONTRACTOR
- 4 ARCHITECT
- 5 SUBCONTRACTORS
- 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
- 7 CHANGES IN THE WORK
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- 9 PAYMENTS AND COMPLETION
- 10 PROTECTION OF PERSONS AND PROPERTY
- 11 INSURANCE AND BONDS
- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS
- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

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. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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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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. The Contract Documents shall include the Bidding Requirements, including, but not limited to Advertisement or Invitation to Bid, Instructions to Bidders, the Contractor's Bid Proposal Form and other bidding forms, or portions of the Addenda relating to any Bidding Documents. The Contract Documents shall apply to all Prime Contractors for the Project and each Prime Contractor is responsible for the content of all.

§ 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.

§ 1.1.2.1 The Contractor acknowledges and warrants that it has closely examined all of the Contract Documents, that they are suitable and sufficient to enable the Contractor to complete the Work in a timely manner for the Contract Sum, and that they include all Work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in full compliance with all applicable codes, laws, ordinances and regulations.

§ 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.

§ 1.1.3.1 The Work shall include the obligation of the Contractor to visit the site of the Project before submitting a bid. Such site visit shall be for the purpose of familiarizing the Contractor with the conditions as they exist and the character of the operations to be carried on under the Contract Documents, including all existing site conditions, access to the site, physical characteristics of the site and surrounding areas.

§ 1.1.3.2 Nothing in these General Conditions shall be interpreted as imposing on either the Owner or Architect, or their respective agents, employees, officers, directors or consultants, any duty, obligation or authority with respect to any items that are not intended to be incorporated into the completed project, including but not limited to shoring, scaffolding, hoists, temporary weatherproofing, or any temporary facility or temporary activity, since these are the sole responsibility of the Contractor.

§ 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.

§ 1.1.5.1 The Drawings are diagrammatical and show the general arrangement and extent of the Work; exact locations and arrangements of parts shall be determined as the Work progresses and shall be subject to the Architect's approval.

- .1 No extra compensation will be allowed due to discrepancies between actual dimensions and those indicated.
- .2 The right is reserved by the Architect to make any reasonable change in location of equipment, ductwork, and piping prior to roughing in without involving additional expense to the Owner.
- .3 Contractor shall coordinate his/her Work within the Work of others, so that interference between mechanical, electrical and other work and the architectural and structural work does not occur.
- .4 Contractor shall furnish and install supports, hangers, offsets, bends, turns, and the like in connection with this Work to avoid interference with work of other Contractors, to conceal Work where required, and to secure necessary clearance and access for operation and maintenance without involving additional expense to the Owner.

§ 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.

§ 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.

(Paragraph Deleted)

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§ 1.2.1.1 The general character of the detail work is shown on the drawings, but minor modifications may be made in large scale details. Where the word "similar" occurs on the drawings, it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to other parts of the work.

- .1 Where on any drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to other like portions of the work.
- .2 Where detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts in the work unless otherwise indicated.
- .3 In case of differences between small and large-scale drawings, the larger scale drawings shall take precedence. Dimensions given shall take precedence over scale measurements.

§ 1.2.1.2 During the course of the work, should any ambiguities or discrepancies be found in the Specifications or on the Drawings; or should there be found any discrepancies between the Drawings and Specifications to which the Contractor has failed to call attention before submitting his/her bid, then the Architect will interpret the intent of the Drawings and Specifications; and the Contractor hereby agrees to abide by the Architect's interpretation and to carry out the work in accordance with the decision of the Architect.

§ 1.2.1.3 It is expressly stipulated that neither the Drawings nor the Specifications shall take precedence over the other, and it is further stipulated that the Architect may interpret or construe the Drawings and Specifications so as to secure in all cases the result most consistent with the needs and requirements of the work. In the event of such ambiguity or discrepancy, the Contractor shall comply with the more stringent requirement, and supply the better quality or greater quantity of work.

§ 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.

§ 1.2.2.1 The various materials and products specified in the Specifications by name or description are given to establish a standard of quality and of cost for bid purposes. It is not the intent to limit the acceptance to any one material or product specified, but rather to name or describe it as the absolute minimum standard that is desired and acceptable.

- .1 A material or product of lesser quality will not be acceptable.
- .2 Where “Basis of Design” products or manufacturer’s names are used, whether or not followed by the words “Or Approved Equal”, they shall be subject to approved equals and authorized only by the Architect and/or the Owner.

§ 1.2.2.2 Substitutions lowering performance, quality, method of assembly or installation, or in general not in keeping with details and specifications, will not be permitted. Refer to substitution procedure indicated elsewhere in the Contract Documents.

§ 1.2.2.3 It is understood when a bid for any product or material is submitted, the bidder is aware of specified requirements and all materials or products within his/her bid are equal or better than such specified items.

§ 1.2.2.4 In addition to the Specifications, it shall be understood that details on Drawings shall become part of the Specification in determining the required “Standard of Quality”.

§ 1.2.2.5 If a conflict occurs between the Drawing details and Specifications, the bidder during the bidding process and/or Contractor shall bring such conflicts to the attention of the Architect in accordance with applicable requirements indicated elsewhere in other sections of the Contract Documents.

§ 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 15.1.3 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

§ 2.1.1 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 Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

Refer to Section 00800 – Supplementary General Conditions

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§ 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 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

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§ 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, except to the extent required by Section 6.1.3.

§ 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. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and 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 deficiencies, 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. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. 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.

- .1 If the Contractor requires clarification of the intent of the Contract Documents after award, the Contractor shall be responsible to issue a type written Request for Information (RFI) to the Architect utilizing the Architect's sample form via acceptable methods set forth in Section 4.2.4.
- .2 All RFI's shall clearly identify the Architect's project number, the Construction Company name, author's name, date issued, address, phone number(s), facsimile number and the addressee of the communication.
- .3 RFI's shall be sequentially identified and numbered when issued to the Architect with the following prefix for each trade and shall be logged accordingly:
S – Structural Work (ex. S1, S2, etc.)

P/FP – Plumbing / Fire Protection Work
H – Heating, Ventilating, Air Conditioning, Refrigeration Work (HVACR)
E – Electrical / Information Technology Work
G – General Construction Work

- .4 RFI's involving Structural, Plumbing / Fire Protection, HVACR or Electrical Work shall be addressed and issued to the Architect and simultaneously issued directly to the respective Consulting Engineer.

§ 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 2.3.4, 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 report 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.

§ 3.2.2.1 Conditions Precedent – Notice

- .1 Notice of any alleged Conflict that have been reasonably identified prior to submitting a Bid shall be provided to the Architect immediately in order that the Architect in its discretion, may issue an Addendum.
- .2 A Bidder's failure to do so constitutes an absolute waiver of any Conflict that may thereafter be asserted with respect thereto and shall bar any recovery regard such Conflict.
- .3 If any errors, inconsistencies or omissions appear in the drawings, specifications or other Contract Documents, which should reasonably have been discovered and concerning which interpretation had not been obtained from the Architect during the Bidding Period, the Contractor shall within ten (10) days after written "Notice of Award", notify the Architect in writing of such error, inconsistency or omission. In the event the Contractor fails to give such notice, the Contractor and its Surety will indemnify the Owner for the costs of any such errors, inconsistencies or omissions and the cost of rectifying same including attorney's fees. Interpretation of this procedure after the ten-day period will be made by the Architect and his/her decision will be final. By Submission of a Bid, the Contractor acknowledges that the Contract Documents are full and complete, are sufficient to have enabled it to determine the cost of the Work and that the Drawings, the Specifications and all Addenda are sufficient to enable the Contractor to construct the Work outlined therein in accordance with applicable laws, statutes, ordinances, building codes and regulations, and otherwise to fulfill all of its obligations under the Contract Documents.
- .4 Contractor acknowledges, except as to any reported error, inconsistencies or omissions, and to concealed or unknown conditions defined in elsewhere, by executing the Agreement, the Contractor represents the following:
 - .1 The Contract Documents are sufficiently complete and detailed for the Contractor to perform the Work and comply with all requirements of the Contract Documents.
 - .2 The Work required by the Contract Documents, including, without limitation, all construction details, construction means, methods, procedures, and techniques necessary to perform the Work, use of materials, selection of equipment, and requirements of products by manufacturers are consistent with:
 - .1 good and sound practices within the construction industry;
 - .2 generally prevailing and accepted industry standards applicable to Work;
 - .3 requirements of any warranties applicable to the Work; and
 - .4 all laws, ordinances, regulations, rules, and orders which bear upon the Contractor's performance of the Work.
 - .3 The Contractor has read, understands and accepts the Contract Documents and its Bid was made in accordance with them.
 - .4 The Contract Sum is based upon the products, materials, systems and equipment required by the Contract Documents without exception. Where the Contract Documents list one or more manufacturer or brand name products, materials, systems and equipment as acceptable, the Contract Sum is, in each instance, based upon one of the listed manufacturers or brand name products, materials, systems and equipment, or, if the Contract Sum is based upon the substitution of an "or equal" manufacturer or product, material, system or equipment, the Contractor has in

each such instance sought and received the Architect's approval for the substitution either:

- .1 prior to the Bid in accordance with the Architect's Addenda;
 - .2 after commencement of the Work, under in conformance with substitution procedures elsewhere in the Contract Documents.
- .5 The Contract Sum is firm and is all inclusive and no escalation is contemplated for any reason whatsoever.
- .1 The Contract Sum includes any and all costs associated with completion by those dates and times, including any and all costs associated with out-of-sequence work, come-back work, stand-by work, stacking of Trades, coordination with the schedules and work of separate Contractors, allowing sufficient time, work and storage areas, and site access for separate Contractors to timely progress and complete their work, overtime, expediting and acceleration that may be required to complete the work by those dates and times.
 - .2 The Contractor has reviewed the completion dates and times, and Milestone dates set forth in the Contract Documents, agrees that such dates and times are reasonable and commits to achieve them.
- .6 The Contractor shall satisfy itself as to the accuracy of all dimensions and locations. In all cases of interconnection of its work with existing or other work, it shall verify at the site, all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to verify all such locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner.

§ 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.

§ 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 and/or his/her Surety shall pay such costs and damages to the Owner, subject to Section 15.1.7, 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.

- .1 At any time within the construction period, the Owner or Architect shall have the right to require the replacement of the Prime Contractor's Project Manager, Superintendent, or Foreman.
- .2 The Owner or Architect shall have the authority to direct the Contractor to assign additional supervisory personnel to ensure compliance with the Contract schedule and qualify requirements at no addition to the Contract price.
- .3 When more than one major phase is being constructed at different locations on the project site, supervision must be assigned to each phase when work of that contract is being performed. When performing construction work to maintain the progress schedule requires extended hours, multiple shifts, and additional work days, adequate supervision shall be required for each Contractor during these times. The competence

level and ability of supervisory personnel must be adequate to perform the construction activities involved and shall be in accordance with requirements indicated elsewhere in the Contract Documents.

§ 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.

§ 3.3.4 Contractor shall lay out his/her own work and be responsible for all lines, elevations and measurements of the building and other work executed by him under the Contract. He/She must exercise proper precaution to verify the figures shown on the Drawings before laying out the work and will be held responsible for any errors resulting from his/her failure to exercise such precaution.

- .1 Contractors whose failure to perform his/her Work or whose negligence in performing his/her Work, negatively impacts other Contractors' work shall be responsible for damages incurred by the other Contractors that are necessary to maintain the project schedules, all as is more fully set forth in the further provisions of the Contract Documents including, without limitation, Section 6.2.5 of the General Conditions.

§ 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 3.12.8 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.

§ 3.4.2.1 Standard of Quality: The various materials and products specified in the Specifications by name or description are given to establish a standard of quality and of cost for bid purposes.

- .1 It is not the intent to limit the Contractor to any one material or product specified, but rather to describe as the minimum standard.
- .2 When proprietary names are used as the "Basis of Design", for specified products or equipment, they shall be followed by the words, "or approved equal in quality necessary to meet the specifications", unless otherwise indicated elsewhere in the Contract Documents.

§ 3.4.2.2 The Architect will evaluate alternatives and substitutions and shall be the sole judge of whether the alternatives (substitutions), are acceptable or not.

- .1 The burden of proving the alternatives (substitutions), are equal or better to the specified product is that of the Contractor.
- .2 Contractor shall submit request for substitution in accordance with substitution procedures indicated elsewhere in the Contract Documents.
- .3 Any alternative names or products which do not meet the Specifications will not be accepted.

§ 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.

§ 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.

§ 3.5.2 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.

§ 3.5.3 The Contractor shall forward guarantee and warranty registration cards to the manufacturers in the name of the Owner showing date of acceptable Substantial Completion of the Work as the beginning date for guarantee and warranty periods.

- .1 All warranties and guarantees shall be in accordance with requirements indicated in applicable Sections of the Contract Documents.

§ 3.6 Taxes

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.

- .1 It shall be the obligation of the Contractor to review the Contract Documents and to determine and to notify the Owner and Architect of any discrepancy between building codes and regulations of which the Contractor has knowledge or should be reasonably able to determine.
- .2 The Contractor shall not violate any zoning, setback or other requirements of applicable laws, codes and ordinances, building codes, rules or regulations. The Contractor shall promptly notify the Architect in writing, and necessary changes shall be accomplished by appropriate Modification.

§ 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.

§ 3.7.4 Concealed or Unknown Conditions

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 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.

§ 3.7.5 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.

§ 3.8 Allowances

§ 3.8.1 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, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 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 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

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

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a full-time competent superintendent and necessary assistants, acceptable to the Owner and the Architect, who shall be in attendance at the Project site during performance of the Work and until Final Completion of all Work including all corrective and punch list items. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 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.

§ 3.9.3 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.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 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.

- .1 Within fifteen (15) days after the date of the Notice to Proceed, the Contractor shall submit to the Architect, on forms supplied by the Architect, a Critical Path Method (CPM) with arrow network diagram Progress Schedule upon which shall be indicated the dates for starting and the dates for completion of all contracts and all divisions of the work in a manner which will coincide with the Time for Completion. Contractor's Construction Schedule shall be in accordance with requirements indicated elsewhere in the Contract Documents.
- .2 The Contractor shall cooperate and consult with other Prime Contractors during the construction of this project. The Contractor shall schedule and execute his/her Work so as to avoid delay to other Prime Contractors. The Contractor is financially responsible to the other Prime Contractors for delay caused by him/her to other Prime Contractors on the Project who are intended to and shall be third party beneficiaries of the Contractor's promise herein above stated in accordance with the further provisions of the Contract

Documents, including, without limitation, Section 6.2.5 of the General Conditions. If contrary to the foregoing, another Prime Contractor shall assert a claim or file an action directly against the Owner on account of delay for which the Contractor is allegedly responsible, the Contractor and its Surety shall indemnify and Hold Harmless the Owner and Architect for such claims, losses or delays of any kind made by another Prime Contractor; provided however, that this indemnity obligation is for the sole and exclusive benefit of the Owner and Architect and shall not be applied to the benefit of any Prime Contractor.

- .3 The Contractor shall immediately, after being awarded the contract, prepare and submit to the Architect, a submittal schedule which will be reviewed by the Architect for the orderliness of the submittals by the Contractor. This schedule shall be provided to the Architect for approval by the Architect within fourteen (14) days of receipt of Contract by the Contractor. The schedule shall be coordinated with the Project's Construction Schedule and shall allow the Architect reasonable time to review submittals.

§ 3.10.2 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.

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

§ 3.10.4 The General Construction Work Contractor (and/or the assigned lead Contractor) shall be the scheduling Coordinator and shall perform all duties and assume all of the responsibilities of the Scheduling Coordinator as set forth in the Contract Documents and shall in addition to the requirements of other sections of the Contract Documents.

- .1 If the General Construction Work Contractor fails to perform its duties as the Scheduling Coordinator adequately or to the Owner's satisfaction, the Owner may, in addition to its other rights and remedies, appoint a substitute Scheduling Coordinator who shall act in the place and with the authority of the original Scheduling Coordinator. In that event, the Owner may, in its sole discretion, choose one of the Separate Prime Contractors or an Independent Consultant as the substitute Scheduling Coordinator. The cost and expense incurred by the Owner to engage such substitute scheduling Coordinator shall be charged to and borne by the General Construction Work Contractor and its Surety.
- .2 The Contractor's failure to cooperate and participate with the Owner and separate Prime Contractors in the development and review of construction schedules as provided in this Section 3.10 shall be a material breach of its obligations, entitling the Owner to exercise all rights and remedies under the Contract Documents and applicable law.
 - .1 In no event shall any revision to any construction schedule constitute the basis for an adjustment in the Contract time or the Contract Sum unless such adjustment is agreed to by the Owner, the Architect and achieved by a Change Order.
 - .2 Float shall belong to the Project and all "float time" belongs exclusively to the Owner and may be used as the Owner, if in its sole discretion determines.

§ 3.11 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.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 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.

§ 3.12.2 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.

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

§ 3.12.4 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.

§ 3.12.5 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.

§ 3.12.6 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.

§ 3.12.7 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.

§ 3.12.8 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.

§ 3.12.9 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.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals,

provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

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 Cutting and Patching

§ 3.14.1 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.

§ 3.14.2 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 Cleaning Up

§ 3.15.1 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.

§ 3.15.2 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.

§ 3.16 Access to Work

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

§ 3.17 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.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce

other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

- .1 Contractor, for itself, its successors and assigns, agrees to indemnify and save Owner, the individual members (past, present and future), its successors, assigns, employees, agent, Architect, Engineers, harmless from and against any and all claims, demands, damages, actions or causes of action by any party, together with any and all losses, costs or expenses in connection therewith or related thereto, including, but not limited to, attorney fees and costs of suit for bodily injuries, death or property damage arising in or in any manner growing out of the work performed, or to be performed under this Contract. Contractor and its successors and assigns agree to indemnify the Owner, its individual members (past, present and future), its successors, assigns, employees, agents, Architect, and Engineers against all fines, penalties or losses incurred for, including, but not limited to, attorney fees and costs of suit, or by reason of the violation by Contractor in performance of this Contract, or any ordinance, regulation, rule of law of any political subdivision or duly constituted public authority. Without limiting the foregoing, the Contractor, at the request of Owner, its individual members (past, present, future), its successors, assigns, employees, agents, Architect, or Engineers, agree to defend at the Contractor's expense, any suit or proceeding brought against Owner, its individual members (past, present, future), its successors, assigns, employees, agents, Architect, Engineers due to, or arising out of the work performed by the Contractor.
- .2 The Contractor assumes the entire risk, responsibility, and liability for any damage or injury of every kind and nature whatsoever (including death, resulting therefrom) to all persons, whether employees of the Contractor or otherwise, and to all property (including the Work itself) caused by, resulting from, arising out of or occurring in connection with the execution of the Work, or in preparation for the Work, or any extension, modification, or amendment to the Work by the Change Order or otherwise. To the fullest extent permitted by law, the Contractor and its Surety shall indemnify and save harmless the Owner, the Architect, the Architect's Consultants, agents and employees of any of them (herein collectively called the "Indemnitees") from and against any and all liability, loss, damages, interest, judgements and liens growing out of, and any and all costs and expenses (including, but not limited to, counsel fees and disbursements) arising out of, relating to or incurred in connection with the Work including, any and all claims, demands, suits, actions or proceedings which may be made or brought against any of the Indemnitees for or in relation to any breach of the Contract for Construction or any violation of the laws, statutes, ordinances, rules, regulations, or executive orders relating to or in any way affecting the performance or breach of the Contract for Construction, whether or not such injuries to persons or damages to property are due or claimed to be due, in whole or in part, to any negligence of the Contractor or its employees, agents, subcontractors, or materialmen, excepting only such injuries and/or damages are the result of the sole gross negligence of the Owner or Architect.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.19 Re-Design

§ 3.19.1 If the Contractor makes, or causes to be made, due to approval of substitute equipment or otherwise, any substantial change in the form, type, system and details of construction from those shown on the Drawings, he/she shall pay for all costs arising from such changes. The Contractor shall pay all Architectural and Engineering fees required to check the adequacy of such changes. Any changes or departures from the construction or details shown shall be made only after written approval from the Architect.

§ 3.19.2 The Contractor represents and warrants the following to the Owner (in addition to the other representations and warranties contained in the Contract Documents), as an inducement to the Owner to execute the Owner-Contractor Agreement, which representations and warranties shall survive the execution and delivery of the Owner-Contractor Agreement and the final completion of the Work.

- .1 that he/she is authorized to do business in the State, County, and/or City where construction will take place at the Project and is properly licensed by all necessary governmental and public authorities having jurisdiction over him/her and over the Work at the site of the Project;

- .2 that he/she is familiar with all Federal, State, Municipal and department laws, ordinances and regulations, which may in any way affect the Work of those employed herein, including but not limited to any special acts relating to the Work or to the Project of which it is a part;
- .3 that such temporary and permanent Work required by the Contract Documents as is to be done by him/her, can be satisfactorily constructed and used for the purposes for which it is intended;
- .4 that he/she is familiar with local trade jurisdictional practices at the site of the Project;
- .5 that he/she has carefully examined the plans; specifications and the site of the Work, and that from his/her own investigations, he/she has satisfied himself/herself as to the nature and location of the Work, the character, quality and quantity of the surface and subsurface materials likely to be encountered, the character of equipment and other facilities needed for the performance of the Work, and the general local conditions, and all other materials which may in any way affect the Work or his/her performance;
- .6 that he/she has determined what local ordinances, if any, will affect his/her Work. He/She has checked for any County, City, Borough, or Township rules or regulations applicable to the area in which the Project is being constructed and in addition, for any rules or regulations of other organizations having jurisdiction, such as chambers-of-commerce, planning commission, industries, or utility companies who have jurisdiction over property on which the Work will be performed. Any costs of compliance with local controls are included in the prices/bid, even if documents of such controlling agencies are not listed specifically in 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 and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided 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.

- .1 All project communications shall be in typewritten 8-1/2" x 11" form and shall be transmitted via one of the following methods:
 - .1 First Class mail delivered through the U.S. Postal Service,
 - .2 Electronic facsimile,
 - .3 Overnight or Common Carrier Service (UPS, FedEx, DHL, etc.)
- .2 Electronic mail (E-mail) **shall not be used**. Any information sent via E-mail, to the Architect and Owner **will not** be recognized as valid communication and will be discarded from the project record.
- .3 Notice of proposed changes. The Architect shall notify the Contractor of all proposed changes to the Contract Documents, after award of the Contract via type written Bulletin, or in the case of minor changes in the work, via other written instrument (letter or facsimile). The Contractor shall submit a proposal to increase or decrease the Contract Sum for approval prior to commencing with the Work change unless there is no change in the Contract Sum or time.

§ 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 13.4.2 and 13.4.3, 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 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 investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 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 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 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.

§ 4.2.12 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.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 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. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

§ 4.2.15 Reference in the technical provisions of the Specifications to standard specifications and test methods including those of the American Society for Testing and Materials (ASTM), the American Iron and Steel Institute (AISI), the American National Standards Institute (ANSI), the American Society of Mechanical Engineers (ASME), the American Society of Heating, Refrigeration and Air Conditioning Engineers (SSGREA), the Factory Mutual System (FM), the National Fire Protection Association (NFPA), Federal Specifications, and other similar nationally recognized technical societies and agencies shall refer to the editions and revisions current with the date of the Contract Documents.

§ 4.2.16 The Architect's decision with respect to proposed substitutions of material or equipment specified by trade name shall be final. The Architect reserves the right to waive Specifications and to accept a proposed substitution which in his/her opinion is superior to the material or product specified, or to limit the Specification to the product or equipment specified.

§ 4.2.17 Approval of substitutions shall not relieve the Contractor of responsibility for adequate fulfillment of all the various parts of the Work, nor from specified guarantees and maintenance. Modification of adjacent or connecting Work required due to any substitution approval shall be provided as part of the substitution.

§ 4.2.18 Insofar as practicable, except as otherwise specified or shown, the material or product of one manufacturer shall be used throughout the Work for each specified purpose.

§ 4.2.19 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in strict accordance with the manufacturer's directions. Should such directions conflict with the Specifications, the Contractor shall request clarification from the Architect before proceeding.

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 Unless otherwise stated in the Contract Documents, the Contractor, within thirty (30) days, after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity 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.

§ 5.2.2 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.

§ 5.2.3 The names of all Subcontractors and material suppliers shall be submitted for approval to the Architect and Owner not later than fifteen (15) days after the date of the Award of Contract unless otherwise authorized by the Architect.

- .1 The list of proposed Subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the Work..2 The description shall be in sufficient detail to allow the Architect to determine general conformance to Contract requirements.
- .3 Approval of the submittals required under this Article shall not relieve the Contractor from conformance to Contract requirements.
- .4 If the Architect and/or the Owner make reasonable objection to a Subcontractor, the Contractor shall substitute a Subcontractor reasonably acceptable to the Architect and the Owner at no additional cost.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.2.5 Written confirmation of award of each major subcontract shall be submitted to the Architect, in form subject to his/her approval, within seven (7) days after receipt of Architect's approval of proposed Subcontractor list as provided under Section 5.2.3 (above).

§ 5.3 Subcontractual Relations

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 with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. 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.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 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; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

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 with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 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.

§ 6.1.3 The General Construction Work Contractor, (and/or the assigned lead Contractor), shall act as the scheduling coordinator for all work of the Separate Prime Contractors and any other activities of the Owner's own forces and shall have direct responsibility for scheduling and coordination of all Work, as more specifically set forth in Article 3. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 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. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 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.

- .1 Should the Contractor cause damage to the work or property of any Separate Contractor on the Project, the Contractor shall, upon due notice, promptly settle with such other Contractor by agreement or otherwise account of any damage alleged to have been so sustained, the Contractor shall defend such proceeding at his/her own expense, and if any judgement against the Owner arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the Owner for any attorney's fees and court costs which the Owner has incurred.

§ 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 3.14.

§ 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 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.

§ 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 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.

§ 7.2 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.

§ 7.3 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;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable 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.

§ 7.3.6.1 For any extra work or portion thereof performed by the Prime Contractor, the cost to the Owner shall include the cost of the extra work plus a maximum allowance of fifteen (15%) percent for overhead and profit.

- .1 For any extra work or portion thereof performed by Subcontractor(s), the cost to the Owner shall include the cost of the extra work to the Subcontractor plus a maximum allowance of ten (10%) percent for overhead and profit, plus the Prime Contractor's overhead and profit not to exceed five (5%) percent of the Subcontractor's cost.
- .2 The cost of bonds and insurance shall be included as part of the overhead and profit.

§ 7.3.6.2 Change Orders shall include all costs, including the cost of preparation of the Change Order, all impact and ripple costs associated with modifications or delays to the work, and all costs associated with modifications to other work.

- .1 The Prime Contractor shall furnish all necessary documentation to support the additional costs, including, but not limited to the following:
 - .1 Copy of the Subcontractor's proposal.
 - .2 Complete breakdown of all costs for labor and materials.
 - .3 Complete breakdown of related costs.
 - .4 Other information as may be requested by the Architect.

§ 7.3.6.3 The overall cost of the Change Order shall be all inclusive and once accepted by the Owner, it shall be considered full and final.

§ 7.3.6.4 No additional time will be granted to the Contractor for minor Change Orders unless each individual Change Order totals more than \$100,000.

§ 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 if the Contractor claims that certain Work constitutes an addition, deletion, or change to the Work, the Contractor shall notify the Owner and Architect at least fourteen (14) days before proceeding with such Work, or else any claim by the Contractor for any adjustment to the Contract Sum or the Contract Time on account thereon shall be deemed waived.

- .1 If the Contractor gives timely notice and the Owner directs the Contractor to proceed with such disputed Work as part of its Work or as a minor change in the Work, the Contractor shall promptly proceed with such disputed Work, subject to later resolution in accord with the requirements of the Contract Documents.
- .2 In that event, the Contractor shall present, at the end of each day that the Contractor performed the disputed Work, a summary of the day's costs attributable to the disputed work, including labor hours and material costs, for verification by the Owner and the Architect.
- .3 Only the costs as verified by the Owner and Architect shall be used in computing any increase in costs for the purposes of the adjustment to the Contract Sum, should it later be determined that the Contractor is entitled to such adjustment.
- .4 Upon request, the Contractor shall provide to the Owner and Architect full supporting documentation for all costs claimed.
- .5 If and to the extent that the Contractor fails to submit such summary each day, its claim for an adjustment to the Contract Sum shall be deemed waived.

§ 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.

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 Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 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.

§ 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. Contractor agrees to increase manpower, increase work hours, and to increase equipment necessary to maintain the Project Construction Schedule, and when also requested by the Architect and the Owner, and shall be without additional cost or charge to the Owner.

§ 8.2.4 Work shall commence within ten (10) days of the issuance by Owner of a Notice to Proceed and shall proceed uninterrupted to Final Completion. The Contractor acknowledges and recognizes that the Owner is entitled to full and beneficial occupancy and use of all or part of the completed Work in accordance with the Milestone

Dates set forth in other sections of the Contract Documents, as per approved Schedule, and that the Owner has made arrangements to discharge its public obligations based upon the Contractor's achieving Substantial Completion of all of the Work within the Contract Time. The Contractor further acknowledges and agrees that if the Contractor fails to complete substantially or cause the Substantial Completion of any portion of the Work, as required by the Project Construction Schedule and/or within the Contract Time, the Owner will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, the Owner and the Contractor agree as set forth (below):

- .1 If the Contractor fails to achieve partial completion within the requirements of the Milestone Dates or the approved Schedule or to achieve Substantial Completion of all or part of the Work when and as required by the Project Construction Schedule, and/or within the Contract Time, the Owner shall be entitled to retain or recover from the Contractor and its Surety, as liquidated damages and not as a penalty, the amounts indicated in other sections of the Contract Documents and commencing upon the first day following expiration of the Project Construction Schedule and/or the Contract Time, as the case may be, and continuing until the actual Date of Substantial Completion.

§ 8.2.5 Adherence to Schedule

- .1 The Owner reserves the right to withhold monthly progress payments if the Contractor is behind schedule, unless the Contractor documents, in writing, any delays that are not the fault of the Contractor and to which the Owner and Architect agree.
- .2 Monthly progress payments will only be released after the Contractor reaches the status of completion for that month contemplated by the Construction Schedule.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and litigation; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

- .1 Any direct claim against the Owner for delay costs caused by another Prime Contractor shall be subject to the provisions of Section 8.3.3

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

§ 8.3.3 No payment shall be made by the Owner to the Contractor as compensation for damages for any delays or hindrances from any cause whatsoever in the progress of the Work, notwithstanding whether such delays are avoidable or unavoidable. The Contractor's sole remedy for delays shall be an extension of time only, pursuant to and only in accordance with Section 8.3. Such extension shall be a period equivalent to the time lost by reason of and all of the aforesaid causes. In no event shall the Owner or Architect be held responsible for any loss or damage or increased costs sustained by the Contractor through any delays caused by the Owner or Architect or any other Prime Contractor. If, contrary to the foregoing provision, the Contractor commences a direct action against the Owner or Architect seeking to recover delay costs and fails to substantially prevail in its claim that the Owner was the cause of the alleged delay, the Contractor shall reimburse the Owner and the Architect as the case may be for any attorneys' fees, professional fees and all other costs and expenses incurred by them associated with analyzing, defending or otherwise opposing any such action; provided, however, that where the delay alleged by the Contractor arises from acts, omissions, or default of another Prime Contractor or another Prime's Subcontractors and Suppliers, then the provisions of Section 8.3.1 shall apply.

- .1 Where the cause of the delay is due to weather conditions, extension of time shall be granted only for unusually severe weather, as determined by reference to historical data. The term "historical data" as used in the preceding sentence shall be construed according to this formula: Average rainfall (or snow or low temperature) for the past five years for the month in question, plus 10 percent. Weather shall not be deemed to be unusually severe unless it is more than 10 percent more severe for that month over the last five years.

§ 8.3.4 The Contractor is required to submit at any construction conference considering any claim and at any proceeding considering an extension of time, and in all subsequent administrative proceedings, all files, records, and the documents of whatever kind pertaining to the Contractor's performance of the project work, the job budget, the

summary of all supporting data worksheets and other documents prepared in connection with the submittal of the Contractor's successful bid.

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.

§ 9.2.1 Contractor must provide draft copies of the Schedule of Values, within fifteen (15) days from the Notice to Proceed. Submit two (2) copies to the Architect.

- .1** Schedule of Values shall include cost of work at the/each Building and for the/each Project and shall include the Architect's Special Project Number. Schedule of Values shall include materials and installation and in accordance with each Specification Section as listed in the Specification Index, as shown on the Drawings and/or as directed by the Architect. Contractor shall include separate line items for the following:
 - .1** Bonds,
 - .2** Insurance,
 - .3** Mobilization,
 - .4** General Conditions,
 - .5** Contractor's Construction Schedule,
 - .6** Submittals (Product Data, Samples, and Shop Drawings),
 - .7** As-Built Drawings and similar requirements as per Section for Closeout Documents,
 - .8** Punch List items and Closeout Documents per Section for Closeout Documents,
 - .9** Final Cleaning,
 - .10** Other items, as directed by the Architect.
- .2** Contractor shall enclose with the Schedule of Values, copies of invoices and/or cancelled checks from Bonding and Insurance Agents for the required cost of the coverage for the project being billed.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the 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. The application for payment shall be on approved AIA G702 Forms and shall be accompanied by a partial waiver of liens in a form acceptable to the Owner and Architect.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, 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.

§ 9.3.2 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 To encourage early purchase, Owner may pay for stored materials and equipment. The following procedures must be followed in order to obtain payment.

- .1 A certificate of insurance naming the Owner as loss beneficiary for the full dollar amount representing the materials stored.
- .2 A Consent of Surety in the amount being requisitioned, said Surety being the Bonding Company of the Prime Contractor.
- .3 Materials to be stored in warehouse must be inspected by the Architect/Engineer and the Contractor will not receive extra compensation for storage costs.
- .4 Any time and travelling expenses for the Construction Inspector to visit and inspect equipment stored will be borne by the Contractor making the off-site storage request.
- .5 Payment invoices for materials stored off site shall be so noted.
- .6 After the receipt of the above, the Construction Inspector will endorse same and forward to the Owner for their approval.
- .7 Payment invoices not following the above format will be rejected in total.
- .8 There will be no storage space available in the existing building(s). Space in new building(s) may be used for storage only if approved, in writing, by the Architect/Engineer and all Contractors having work in the area.
- .9 The Contractor will be paid for storage materials no more than the actual or replacement value of the materials. The Contractor will furnish vendors price lists, priced inventories or other documentation to support claims for payment of materials stored on or off site.

§ 9.3.3 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.

§ 9.4 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;
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.
- .8 **deliberate delay in the submission for approval of names of Subcontractors, Materialmen, sources of supply, product data, shop drawings and samples; or**
- .9 **otherwise failing to comply with the requirements of 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.

- .1 If the Contractor disputes any determination by the Architect with regard to any Certificate of Payment, the Contractor nevertheless expeditiously shall continue to prosecute the Work.
- .2 The failure of the Owner to retain any percentage payable to the Contractor or any change in or variation of the time, method or condition of payments to the Contractor shall not release or discharge to any extent whatsoever, the Surety upon any bond given by the Contractor hereunder. The Owner shall have the right, but not the duty, to disregard any schedule of items and costs that the Contractor may have furnished and defer or withhold in whole or in part any payment if it appears to the Owner, in its sole discretion, that the balance available in the Contract Sum as adjusted and less retained percentages, may be insufficient to complete the Work.
- .3 Notwithstanding any provision of any law to the contrary, the Contractor agrees that the time and conditions for payment under the Contract for Construction shall be as stated in the Contract for Construction and in the Contract Documents. The Contractor specifically agrees that the Owner's failure to give, or timely give notice of:
 - .1 any error in an invoice or application for payment submitted by the Contractor for payment; or
 - .2 any deficiency or non-compliance with the Contract Documents with respect to any Work for which payment is requested, shall not waive or limit any of the Owner's rights or defenses under the Contract for Construction and the Contract Documents, or require the Owner to make a payment in advance of the time, or in an amount greater than, as provided by the Contract for Construction.

- .4 The Contractor shall make payments to its Subcontractors in accordance with the provisions of any applicable law governing the time, conditions, or requirements for payment to its Subcontractors, and shall comply with the provisions of any such law.
 - .1 The Contractor will pay its Subcontractors no later than fifteen (15) days after receipt of a payment from the Owner which includes payment for the Work of any such Subcontractors.
 - .2 The Contractor shall require its Subcontractors, by appropriate agreement, to pay their Subcontractors and Suppliers (of any tier) within the same time.
 - .3 The Contractor and its Surety shall indemnify and defend the Owner any loss, cost, expenses, or damages, including Attorney's fees arising from or relating to the Contractor's failure to comply with such law.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the 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 The Contractor's 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 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 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 Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding

dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 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.

- .1 Owner's beneficial occupancy must be approved by all governing authorities having jurisdiction and by issuance of a temporary or permanent "Certificate of Occupancy" and in accordance with all applicable Codes and Regulations.
- .2 Substantial Completion occurs when each of the following conditions precedent has occurred:
 - .1 the Work has been sufficiently completed in accordance with Contract Documents so that the Owner obtains beneficial use and occupancy of the Work;
 - .2 Certificates of Occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project have been received by the Owner; and
 - .3 the Architect has issued a certificate of Substantial Completion. The date of Substantial Completion is the date certified by the Architect in accord with the Contract Documents and shall follow the Contractor's Notification for Substantial Completion inspection and the Architect's inspection of the Project.

§ 9.8.2 Unless otherwise indicated in the Contract Documents, no later than thirty (3) calendar days, prior to the date scheduled for Substantial Completion, the Contractor shall prepare and submit to the Architect and Owner, a comprehensive punch list of items remaining to be completed or corrected.

- .1 No later than ten (10) calendar days prior to the date for Substantial Completion, the Architect and/or Owner may add additional items requiring completion or correction.
- .2 The Contractor shall immediately proceed with the Work required by the punch list and shall complete and correct items on or added thereto by the date scheduled for Substantial Completion.
- .3 When the Contractor determines that the Work has reached Substantial Completion, or when the Owner, Architect so determine and direct the Contractor to do so, the Contractor shall request the Architect's final inspection to determine Substantial Completion. In addition, the Contractor shall prepare and submit to the Architect and Owner its final Application for Payment submitted in compliance with the requirements of the Contract Documents and shall thoroughly reinspect the Work; prepare and submit to the Architect and Owner a comprehensive final punch list of any and all items remaining to be completed or corrected (whether or not included on any previous punch list).
 - .1 Within fourteen (14) calendar days after receipt of the Contractor's request and final punch list, the Architect will inspect the Work to determine whether Substantial Completion has occurred.
 - .2 If the Architect determines that Substantial Completion has not occurred, it shall advise the Contractor and the Owner of the reasons for their determination and the Contractor shall continue with the Work and request another inspection for Substantial Completion and submit another final punch list after the concerns of the Architect have been addressed.
 - .1 The fees and expenses incurred by the Owner for services of the Architect as a result of any additional re-inspections of the Work, shall be paid by the Contractor or its Surety.
 - .3 When the Architect determines after an inspection under this Section that Substantial Completion has occurred the Architect shall:
 - .1 add to the Contractor's final punch list any additional items which they discover which also need to be completed or corrected;
 - .2 determine and certify the amount required to complete each item on the punch list, basing such determination upon the amount the Owner would have to expend or incur to complete each item if the Contractor failed to do so; and
 - .3 prepare and issue a certificate of Substantial Completion, which shall establish the date of Substantial Completion.
 - .4 The Contractor shall proceed promptly to complete and correct items on the final punch list within thirty (30) calendar days of the date of Substantial Completion or prior date established for Final Completion in other sections of the Contract Documents.

- .5 The failure of items to appear on any punch list shall not constitute an acceptance of any Work not in accord with the Contract Documents nor relieve the Contractor or its Surety of responsibility with respect thereto.
- .6 Warranties required by the Contract Documents shall commence on the approved date of Substantial Completion of the Work for the entire project unless otherwise provided in the Certificate of Substantial Completion.
- .7 The Architect shall submit the Certificate of Substantial Completion to the Owner and Contractor. If not completed within this time, the Owner may proceed to finish the Work as otherwise provided in this Agreement.

§ 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, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. 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. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 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 As portions of the Project are completed and occupied, the Contractor shall ensure the continuing construction activity will not unreasonably interfere with the use, occupancy and quiet enjoyment of the completed portions thereof.

- .1 The Contractor agrees to coordinate the Work with the Architect and the Owner in order to minimize disturbance to occupied portions of the structure.
- .2 In the event performances or scheduled events by the Owner are conducted in close proximity to the Work in progress, the Contractor agrees to cease all Work which may disturb the Owner's occupants at the site.

§ 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 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 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

- .1 If more than one inspection for Final Completion is required, the Contractor will be billed and responsible for the professional fees and services of the Architect.
- .2 Following Substantial Completion, in the event the Contractor or their Subcontractor fails to complete the list of items of the Work instructed by the Architect to be corrected or completed within fourteen (14) days after the date of receipt of Certificate of Substantial Completion, the Owner may:
 - .1 exercise any available remedies to correct or complete deficient work or retain a third party to correct or complete such work at the cost of the defaulting Contractor; and
 - .2 retain and deduct from any payments or retention otherwise due to the defaulting Contractor any fees and expenses for services required to be provided by the Architect more than twenty-one (21) days after the Date of Substantial Completion.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

- .1 The General Contractor (and/or assigned Lead Contractor) shall provide all necessary temporary enclosures, guardrails, barricades, etc., to adequately protect all workers and public from possible injury subject to Section 10.1.1.2 (below).
- .2 The General Contractor (and/or assigned Lead Contractor) shall be responsible for the general safeguarding of the Project, for gaining compliance with the safety requirements from all other Contractors and parties engaged in operations at the site and shall act as the Project Site Representative with regard to all safety inspections required and shall perform all necessary functions for this purpose.

§ 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; and
- .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.

§ 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 3.18.

§ 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.

§ 10.2.8 Injury or Damage to Person or Property

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 within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.9 Lost or Stolen Materials

§ 10.2.9.1 The Contractor shall protect all materials and equipment and equipment for which he/she is responsible, which is stored at the Project Site for incorporation in the Work, or which has been incorporated into the Work. He/She shall replace at his/her expense all such materials and equipment which may be lost, stolen or damaged, whether or not such materials or equipment have been entirely or partially paid for by the Owner.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 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.

§ 10.3.2 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. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. 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.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 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.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 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. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

- .1 Certificate of insurance shall be submitted within ten (10) days upon notification of award of Contract.
- .2 The Contractor may carry whatever additional insurance he/she deems necessary to protect himself/herself against hazards not covered by the Owner's Property Insurance, including coverage for theft, collapse, water damage, materials and equipment stored on the site, and for materials and equipment stored off site, and against loss of owned or rented capital equipment and tools owned by mechanics or any tools, equipment, scaffolding, staging, towers and forms owned or rented by the Contractor, the capital value of which is not included in the cost of the work. The Owner's "All Risk" Insurance does not cover theft of materials unless installed and made an integral part of the building. This loss must be assumed by the Contractor.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 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.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within five (5) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

- .1 The Property Insurance obtained by the Owner shall include collapse and water damage, to the extent covered by the Owner's "All Risk" insurance.
- .2 The Owner agrees to be responsible for losses not covered by Property Insurance due to statutory deductible provisions.
- .3 The fact that the Owner is furnishing Property Insurance shall not be interrupted to relieve the Contractor of his/her obligation to complete the work without additional cost to the Owner beyond the Contract amount, except as provided in Section 11.2.1.2 (above).

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change

Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's Consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

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

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. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement 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 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 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 designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or 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. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. 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. The Contractor shall bear all costs of correcting any and all Work not complying with this warranty, and the Contractor and its Surety shall indemnify the Owner for all costs, expenses, losses, and/or damages incurred by the Owner, including Attorney's fees, additional testing and inspections and compensation for the services and expenses of the Architect made necessary thereby. This warranty is in addition to any other warranty or remedy provided elsewhere in the Contract Documents and shall survive the expiration of any such other warranty, acceptance of a final payment for the Work, and the termination of the Contract for Construction.

§ 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.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 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.

§ 12.3.1 The Contractor and its Surety guarantee to make good, repair and/or correct, at no cost or expense to the Owner, any and all latent defects hereafter discovered, provided only that notice in writing, shall be given by the Owner to the Contractor within one (1) year of the discovery of such defects.

- .1 This obligation shall survive the termination of any or all other obligation or obligations under the Contract Documents and it is agreed by the Contractor and its Surety that in the event the Owner is required to bring suit under this provision against the Contractor or its Surety to enforce this obligation, the Contractor and its Surety hereby waive any defense of the status of limitations.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

- .1 Contractor must comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities, utility companies, National Board of Fire Underwriters, and others which bear on performance of Work. Deliver to the Owner, certificates and other required legal evidence and proof of compliance with the above.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, 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.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 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.

§ 13.3.2 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.

§ 13.4 Tests and Inspections

§ 13.4.1 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.

§ 13.4.2 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 13.4.1, 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 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 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.

§ 13.4.4 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.

§ 13.4.5 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.

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

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, their agents or employees, or any other persons performing portions of the

Work

(Paragraph Deleted)

under contract with the Contractor

(Paragraphs Deleted)

because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work or under any order of any Court or other public authority having jurisdiction, the Contractor may, upon seven (7) additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of 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. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 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 costs of finishing the Work, including compensation for the services of any Consultants and the Architect's services and expenses made necessary thereby, and the other costs and expenses identified hereinafter, exceed the unpaid balance of the Contract Sum, the Contractor and its Surety shall pay the difference to the Owner upon demand. The costs of finishing the Work include, without limitation, all reasonable Attorney's fees, additional title costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect consequential costs, including, without limitation, Liquidated Damages for untimely completion as specified in the Contract Documents, incurred by the Owner by reason of, or arising from, or relating to the termination of the Contractor as stated herein.

§ 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 for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No 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

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work performed as of the date of termination in accordance with the Contract Documents. The Contractor shall, as a condition of receiving the payment(s) referred to herein, execute and deliver all such papers, turn over all plans, documents and files of whatsoever nature required by the Owner and take all such steps, including the legal assignment of its contractual rights, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor. The Contractor warrants that it will enter into no subcontracts or other agreements that would adversely impact the Owner's rights or increase the Owner's obligations under this Section. In no event shall the Owner be liable to the Contractor for lost or anticipated profits or consequential damages, or for any amount in excess of the compensation due to the Contractor in accord with the Contract Documents for the Work performed as of the date of termination. The warranty and indemnity obligations of the Contractor and Surety shall survive and continue, notwithstanding and termination pursuant to this Section, with respect to the Work

performed as of the date of termination.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

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 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law.

- .1 No act or omission by the Owner or Architect, or by anyone acting on behalf of either shall be deemed or construed as a waiver or limitation of any right or remedy under the Contract Documents, or as an admission, acceptance, or approval with respect to any breach of the Contract for Construction or failure to comply with the Contract Documents by the Contractor, unless the Owner expressly agrees, in writing.
- .2 The Owner's exercise, or failure to exercise any rights, claims or remedies it may have arising out of or relating to the Contract Documents shall not release, prejudice, or discharge the Owner's other rights and remedies, nor shall it give rise to any right, claim, remedy or defense by any other person, including the Contractor, its Surety, any Subcontractor, or any other person or entity.
- .3 Whenever possible, each provision of the Contract Documents shall be interpreted in a manner as to be effective and valid under applicable law. If, however, any provision of the Contract Documents, or portion thereof, is prohibited or found invalid by law, only such invalid provision or portion thereof shall be ineffective and shall not invalidate or affect the remaining provision of the Contract Documents or valid portions of such provision, which shall be deemed severable.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to 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 and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

- .1 The Owner has the responsibility to make a claim as promptly after recognizing or receiving notice of a condition which give reason for a claim.
- .2 The Contractor must provide notice of a claim prior to the submission of a payment requisition, not later than the submission of the second payment requisition following the date the Contractor knew or should have known of the condition giving rise to the claim.

§ 15.1.3.2 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. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 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.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 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.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 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.

§ 15.1.6.2 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.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those 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 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon

receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 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. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 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.

§ 15.3.4 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.

§ 15.4 Arbitration

§ 15.4.1 All questions in dispute between the Owner and the Contractor shall be determined by the Courts having jurisdiction of the subject matter, and neither party shall submit to arbitration by the American Arbitration Association or any other arbitration agency.

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§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

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SECTION 00800 - SUPPLEMENTARY GENERAL CONDITIONS

PART 1 - GENERAL

1.1 GENERAL

- A. The following Supplementary General Conditions supplement, modify, change, delete from or add to the "General Conditions of the Contract for Construction", AIA Document A201, 2017 ("**General Conditions**"). Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect. These Supplementary General Conditions take precedence over any conflicting provisions in the General Conditions.
- B. Refer to other Sections in Division 1 "General Requirements" for additional modifications, deletions and additions to the "General Conditions of the Contract for Construction."

1.2 ARTICLE 2 OWNER

- A. PARAGRAPH 2.2 - INFORMATION AND SERVICES REQUIRED OF THE OWNER:

Insert the following Paragraph:

2.2.1 The Architect will furnish the successful contractor, the following number of sets of drawings and specifications, signed and sealed for purposes of obtaining NJ Uniform Construction Plan Review by the Municipal Construction Official having jurisdiction over the project to obtain Construction Permits.

Single Overall Contract 3 Sets

- B. Additional copies can be provided upon request in writing to the Architect at the Architect's reproduction costs.

1.3 SUBMITTALS

- A. Supplement Paragraph 3.12 "Shop Drawings, Product Data and Samples", as follows:

3.12.11 Contractor shall provide separate submittals for each Project with reference to Architect's Project Number. Contractor shall, within ten (10) working days from the issue date of the Notice of Award, forward to the Architect a written submittal log including all of the following information:

- .1 A list of all required submission items grouped by technical section division number as set forth in the specifications,

- .2 If in variance with the Milestone Dates Specified in Section 1:01800, the dates upon which each submission will be made by the contractor and the date by which the contractor expects same to be returned to him/her by the Architect, allowing a reasonable time for review,
- .3 Critical items and long lead items shall be so noted on the log,
- .4 A sequence of submissions reasonably based upon the expected progress of the Project.
- .5 Submittals will be mandatory and shall meet time requirements established in other sections of the Contract Documents.
- .6 The Contractor shall complete the entire submission process as soon as possible but in no event later than the time set forth in Section 1:01800 after the Notice of Award. Exceptions may be made if so noted on the submission log, with good reason, and subject to the Architect's approval.
- .7 Omission of any required submittal item from the log does not relieve the Contractor of his/her obligation to make timely submissions of same. The Contractor shall keep their his/her submission log up to date at all times. He/She will provide an updated copy to the Architect, at any time, upon request.

3.12.12 All project submittals are to be complete and provide all information required by the Contract Documents including, but not limited to, model numbers, applicable technical requirements, selected features, color, finish, and other options. Improperly prepared submittals sent to the Architect will be returned without action. The Contractor is responsible to field verify all dimension and conditions effecting the preparation of submittals and the Work.

3.12.13 Submittals provided by the Contractor on behalf of subcontractors and suppliers must be reviewed for completeness and approved by the Contractor prior to submitting same to the Architect. The Contractor will be solely responsible for improperly prepared submittals.

3.12.14 Submittals are to be provided to the Architect consistent with the sequence of the proposed Work.

3.12.15 All fabricated work shall require shop drawings.

3.12.16 Submittal Procedures: The Contractor's failure to follow proper procedures for submittals constitutes grounds for withholding of payments until such time as the Contractor is in compliance. Proper submittal procedures include all of those set forth elsewhere in this specification including the following:

- .1 Failure to adhere to deadlines for completion of submittals and record/resubmittals.
- .2 Failure to provide submittals in good order as required by the Contract Documents.
- .3 Failure to provide submittals in relationship to the progress of the work.
- .4 Performance of work or part of the work, without complete approved submittals.

3.12.17 Architect / Engineer's actions for submittals shall be as follows:

- .1 Submittals returned to the Contractor marked "Approved" allow the Contractor to proceed with the work.
- .2 Submittals returned to the Contractor "Approved As Noted; "Resubmit For Record:"
 - .1 The Contractor may proceed with work, however noted items by the Architect / Engineer (or any affected portion of the submittal), must be corrected and resubmitted to the Architect's office within ten (10) working days of Contractor's receipt of the original submittal. Final acceptance of all work is subject to the Contractor's compliance with requirements of the Contract Documents.
 - .3 Submittals returned marked "Returned for Corrections" require the Contractor to resubmit corrected or alternate data in accordance with the corrections indicated.
 - .1 The originals of the reproducible transparencies marked "Returned for Corrections" shall be corrected until approval is obtained. The Contractor shall provide such number of prints of transparencies marked "Approved" as required for the expeditious execution of the work.
- .4 Submittals returned marked "No Action Taken:"
 - .1 The Contractor may not proceed with the work. The Architect / Engineer will not review submittals so marked until the Contractor has properly completed the submittal or corrected the reasons stated thereon.
 - .2 Reasons for "No Action Taken" on a submittal include, but are not limited to the Contractor's failure to:
 - .1 Submit an approved sub-contractor or supplier.

- .2 Indicate job specific product data such as catalog number, size, type or material on each submittal.
 - .3 Submit complete data, test reports or similar information, as required by the Contract Documents.
 - .4 Obtain prior approval for substitution.
 - .5 Submit documents in a legible or orderly fashion.
 - .6 Adhere to any submittal requirements set forth in the Contract Documents.
 - .7 Submit only submittals which are called for in the Contract Documents, other submittals will not be reviewed by the Architect / Engineer.
- .5 Shop drawing submittals and color selection approvals by the Architect:
- .1 The Contractor shall submit all shop drawing submittals within the specified time stipulated in contract documents.
 - .2 The Architect / Engineer shall release/ return to the Contractor the approved color selections to coincide with the approved Milestone Schedule/ Project Phasing if more than one construction phase is identified in Section 01800.
- .6 Long Lead Items:
- .1 In addition to and concurrent with the submission of the "Schedule of Values", Contractor shall submit a list of all materials, equipment or components which are anticipated to require more than four weeks delivery, together with scheduled ordering and delivery time table.
 - .2 This will be discussed and reviewed regularly at the job meetings.
 - .3 Upon request by the Architect / Engineer, the Contractor shall be prepared to produce evidence of having placed orders for specific materials, equipment and components.
 - .7 The Contractor will not be entitled to receive payment or Work performed by the Contractor for which submittals were required to be submitted for review and approval by the Architect. All Work installed in variance with the Contract Documents will be rejected.

3.12.18 Request for Substitutions:

- .1 Unless otherwise indicated in the Contract Documents, substitutions may be considered after the award of Contracts. Subsequent requests will be

considered only when, through no fault of the Contractor, none of the specified products are available.

- .2 Submission of request for substitution shall constitute a representation by the Contractor that he/she:
 - .1 Has investigated the proposed product and determined that it is equal to or better than the specified product.
 - .2 Will provide the same variety for the proposed product as for the specified product.
 - .3 Will coordinate the installation and make other changes which may be required for the work to be complete in all respects, including:
 - .1 Re-design.
 - .2 Additional components and capacity required by other work affected by the change.
 - .3 Waives all claims for additional costs and time extensions which subsequently may become apparent and which are caused by the change.
- .3 Substitutions will not be considered when acceptance would require substantial revision of the contract documents.
- .4 Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request.
- .5 Substitution requests will not be considered when submitted directly by subcontractor or supplier.
- .6 When the proposed substitution is not accepted, Contractor(s) must provide the product (or one of the products, as the case may be) specified.
- .7 The Contractor will be notified in writing within a reasonable time, verbal acceptance will not be valid.
- .8 Acceptable substitutions will be added to the contract documents by appropriate modifications.
- .9 Requests for substitution will be reviewed by the Architect upon receipt of all the information requested in the following paragraph. Failure to provide the required information shall be cause for rejection of substitution request.
- .10 Submittal for Substitutions:

- .1 The Contractor shall begin the submission process as soon as possible after the Notice to Proceed, but in no event later than fifteen (15) working days after Notice to Proceed.
- .2 The Contractor shall sequence and time his/her submissions in a reasonable and orderly fashion. He/She will allow for sufficient time for the Architect's review as well as the transmission of same amongst all project participants.
- .3 In the case of color selections, the Contractor is responsible for the completion of all required and related submissions, including samples, prior to the Owner's selection of colors. Exceptions can be made for certain long lead items so identified on the submittal log.
- .4 The Contractor shall complete the entire submission process as soon as possible but in no event later than thirty (30) calendar days after Notice to Proceed.
 - .1 Exceptions may be made if so noted on the submission log, with good reason, and subject to the Architect's / Engineer's approval.
 - .2 Upon receipt by the Architect, he/she will review same and advise the Contractor if the log is acceptable.
 - .3 At no time will the Contractor unduly burden the Architect / Engineer with excessive or unreasonable submittals made at one time.
 - .4 An advertent omission of any required submittal item from the log does not relieve the Contractor of his/her obligation to make timely submissions of same. The Contractor shall keep his/her submission log up to date at all times. He/She will provide an updated copy to the Architect, at any time, upon request.
- .5 Submit three (3) copies of requests for substitutions, fully identified for product, material or method being replaced by substitution, including related specification section and drawing number(s), and fully documented to show compliance with requirements for substitutions. Submit the following:
 - .1 Complete product data, drawings, and descriptions of materials and methods where applicable. Provide manufacturer's name and address, trade name, and model number of product (if applicable), and name of fabricator or supplier (if applicable).
 - .2 Samples where applicable or requested.
 - .3 Detailed comparison of significant qualities (size, weight, durability, performance and similar characteristics, and including visual effect where

applicable) for proposed substitution in comparison with original requirements.

- .4 List, with addresses, of three (3) projects where proposed substitution has been used previously and successfully in a similar application.
- .5 Coordination information indicating every required change in every other element of the work which is affected by substitution, extended to include work by Owner and separate contractors.
- .6 A complete statement of effect substitution will have upon schedule of the work, including its effect (if any) on Contract Time (in comparison with compliance with requirements without approval of proposed substitution).
- .7 Cost information, including a proposal of net change in Contract Sum (if any).
- .8 Certification by Contractor to the effect that, in his/her opinion and after his/her thorough evaluation, proposed substitution will result in total work which is equal to or better than the work originally required by contract documents, in every respect of significance except as specifically stated in certification; and that it will perform adequately in application indicated, regardless of equality and exceptions thereto.
- .9 Include in certification, Contractor's waiver of rights to additional payment and time which may subsequently be necessitated, by failure of substitution to perform adequately and for required work to make corrections thereof.

3.12.19 Approval of Substitutions:

- .1 Requests for substitution(s) will be reviewed for compliance with the specifications based upon the data provided by the Contractor. Approval or rejection will be based on samples, technical data and other items submitted and will be reviewed once and only once for each such request.
- .2 Change Order Form: Submit requests for substitution(s) which propose a change in either the Contract Sum or Contract Time by procedures required for change order proposals.

1.4 ARTICLE 5 SUBCONTRACTORS

- A. 5.2.1 In Line 2, delete: "within 30 days after award of the Contract,"

1.5 ARTICLE 9 PAYMENTS AND COMPLETION

A. Supplement Paragraph 9.2 "SCHEDULE OF VALUES" as follows:

9.2.2 Immediately after Award of Contract, the Contractor shall prepare and submit a Schedule of Values, breaking down all Work by type and Trade. Each scheduled value line item shall be for material and labor for each entity of Work.

9.2.3 Project soft costs including, but not limited to, bond, insurance, mobilization, supervision, submittals, punch-list, training, as-built drawings and close-out documents, shall be indicated in separate line items.

9.2.4. Project Allowances: Include all project allowance(s) at the end of the schedule of values to allow subsequent draw-down when authorized in writing by the Architect.

9.2.5 When an advertisement for bid has included multiple buildings in a single project, the Contractor shall submit separate Schedule of Values for each building.

9.2.6 Unless printed invoices are provided by the Contractor from Insurance and Bonding Companies for which payment is being requested, a maximum of one and one half (1-1/2%) of the total cost of the awarded Contract Amount will be allowed.

B. Supplement Paragraph 9.6 "PROGRESS PAYMENTS", as follows:

9.6.9 Unless indicated otherwise in the contract documents, pursuant to N.J.S.A.18A:18-40.3, If the contractor does have a performance bond, 2% of the amount due on each partial payment shall be withheld by the board of education when the outstanding balance of the contract exceeds \$500,000, and 5% of the amount due on each partial payment shall be withheld by the board of education when the outstanding balance of the contract is \$500,000 or less, until final completion and acceptance of all work covered by the Contract, including the completion of all corrective or punch list items.

9.6.10 Final payment will be made provided the work has been completed, the contract fully performed and a final certificate for payment has been issued by the Architect.

9.6.11 As required by N.J.S.A. 2A:30A-1, this is to inform you that as a governmental entity, the School District may require longer to make payment than 30 calendar days after receipt of your billing. Payment will be made within 30 days of receipt of the application for payment unless a vote of authorization by the Board is required. As provided by law, payments that require a vote of authorization may be certified at the next scheduled public meeting and paid during the next subsequent payment cycle.

9.6.12 The Architect shall review applications and certifications for payment submitted by the Contractor which have been signed and certified as required by the Contract Documents. By submitting an application and certification for payment, the Contractor is representing that it has verified that all Work for which payment is being requested,

has been completed in accordance with all the requirements of the Contract Documents.

9.6.13 The Architect's approval of the Contractor's certification for payment shall constitute a representation to the Owner, based on the Architect's evaluation of the Contractor's Work and on the data comprising the Contractor's Application for Payment, that, to the best of the Architect's knowledge, information and belief, and, based on periodic on-site observations, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The Architect is not responsible to provide continuous observation of the Work.

1.6 ARTICLE 11 INSURANCE AND BONDS

A. Supplement Paragraph 11.1 "Contractor's Insurance and Bonds", as follows:

11.1.5 Contractor's liability insurance must be maintained until the final Certificate of Payment is issued pursuant to Paragraph 9.10.1 and Completed Operations Insurance is in effect.

11.1.6 Insurance specified to be provided by the Contractor under Paragraph 11.1 shall be on an occurrence basis, as follows:

- .1 The Contractor shall take out and maintain during the life of this Contract commercial general liability insurance, covering any and all bodily injury, including accidental death, as well as claims for property damage arising out of or in connection with the Work performed hereunder, whether such Work be performed by the Contractor or by any subcontractor or by anyone directly or indirectly employed by either of them.
 - .1 The policy shall name the Owner, the Architect, and their consultants and agents and employees as additional insureds.
 - .2 The Contractor shall take out and maintain comprehensive automobile liability insurance, including coverage for all owned, non-owned and hired vehicles, covering bodily injury and property damage.
 - .1 The policy shall name the Owner, the Architect, and their consultants and agents and employees as additional insureds.
 - .3 Contractual liability insurance as applicable to the Contractor's obligations under Paragraph 3.18 of the AIA General Conditions.
 - .4 Completed Operations Insurance written to the limits specified for liability insurance specified AIA A101 - 2017, Exhibit A, Article A.3 - Contractor's Insurance and Bonds. Coverage shall be required from the date of the start of Beneficial Occupancy until one (1) year after the issuance date of Final Certificate for Payment.

- .5 Certificates of insurance must be submitted on the ACORD Form, Certificate of Insurance.
- .6 The Contractor shall either:
 - .1 require each of his/her subcontractors to procure and to maintain during the life of their subcontracts, Subcontractor's Public Liability and Property Damage, of the type and in the same amounts as specified in the preceding paragraph; **or**
 - .2 insure the activities of their subcontractors under their respective policies.

B. Paragraph 11.3 WAIVERS OF SUBROGATION

Delete Paragraph 11.3.2 in its entirety.

C. Supplement Article 11 INSURANCE AND BONDS, as follows:

Paragraph 11.6 PERFORMANCE BOND AND PAYMENT BOND

11.6.1 Contractor shall furnish each of the performance bond and payment bond meeting all statutory requirements of the State of New Jersey in form and substance satisfactory to the Owner and, without limitation, complying with the following specific requirements:

- .1 Except as otherwise required by statute, the form and substance of such bonds shall be satisfactory to the Owner in the Owner's sole judgment;
- .2 The bonds shall be executed by an approved surety company authorized to do business in the State of New Jersey and in accordance N.J.S.A. 2A:44-143 and with the three highest rating categories of rating companies nationally recognized and listed as per Appendix A, (go to www.nj.gov/dobi/surety.htm), and shall remain in effect for a period of not less than two years following the date of substantial completion or the time required to resolve any items of incomplete or inadequate work and the payment of any disputed amounts, whichever time period is longer;
- .3 The performance bond and the labor and material payment bond shall each be in an amount equal to the Contract Sum;
- .4 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his/her power of attorney indicating the monetary limit of such power;
- .5 Any bond under this Paragraph 11.4.1 must display the surety's bond number. A rider including the following provisions shall be attached to each bond:

- .1 Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change or other modification of the Contract Documents. Any other alterations, change, extension of time or other modification of the Contract Documents or a forbearance on the part of either the Owner or the Contractor to the other shall not release the surety of its obligations hereunder and notice to surety of such matter is hereby waived.
- .2 Surety further agrees that in the event of any default by the Owner in the performance of the Owner's obligations to the Contractor under the Contract, the Contractor or surety shall cause written notice of such default (specifying said default in writing) to be given to the Owner, and the Owner shall have thirty (30) calendar days after receipt of such notice within which to cure such default or such additional reasonable time as may be required if the nature of such default is such that it cannot be cured within thirty (30) calendar days. Such notice of default shall be sent by certified or registered U.S. mail, return receipt requested, first class postage, prepaid to the Owner.

1.7 ARTICLE 13 MISCELLANEOUS PROVISIONS

- A. Delete Paragraph 13.5 "INTEREST" in its entirety.

END OF SECTION 00800

SECTION 00850 - CONTRACT DRAWINGS

- 1.1 All Drawings listed on drawing No. G001, "Title Sheet, Drawing Index and General Information," dated January 13, 2020, unless otherwise revised or amended (via Addenda, Bulletin, etc.), shall form a part of the Contract Documents.

END OF SECTION 00850

SECTION 00860 - LAWS GOVERNING PUBLIC WORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The paragraphs below supplement the General Conditions. Attention is called, but not limited, to the following Laws Governing Public Work.

1.2 STATE SALES AND USE TAX EXEMPTION

- A. Supplement paragraph 3.6 "Taxes" as follows:

3.6.2 As a New Jersey governmental entity, the Board of Education is exempt from the requirements under New Jersey state sales and use tax (N.J.S.A. 54:32B-1 et seq.), and does not pay any sales or use taxes. Bidders should note that they are expected to comply with the provisions of said statute and the rules and regulations promulgated thereto to qualify them for examinations and reference to any and all labor, services, materials and supplies furnished to the Board of Education. Contractors may not use the Board's tax identification number to purchase supplies, materials, service or equipment, for this project.

.1 A contractor may qualify for a New Jersey Sales Tax Exemption on the purchase of materials, supplies and services when these purchases are used exclusively to fulfill the terms and conditions of the contract with the Board of Education. All contractors are referred to New Jersey Division of Taxation-Tax Bulletin S&U-3 and in particular, Contractor's Exempt Purchase Certificate (Form ST-13). Again, contractors are not permitted to use the Board's tax identification number to purchase supplies, materials, services of equipment.

1.3 MUNICIPAL REQUIREMENTS

- A. Supplement paragraph 3.7 "Permits, Fees and Notices" as follows:

3.7.1.1 N.J.S.A. 52:27D-130, provides that local Municipal Construction Enforcing Agency issue required construction permit, perform required inspections during construction, and issue required certificate of occupancy upon completion of Project.

3.7.1.2 N.J.S.A. 52:27D-126C, "No county, municipality, or any agency or instrumentality thereof shall be required to pay any municipal fee or charge in order to secure a construction permit for the erection or alteration of any public building or part thereof from the municipality wherein the building may be located. No erection or alteration of any public building or part thereof by a county, municipality, school board, or any agency or instrumentality thereof shall be subject to any fee, including any surcharge or training fee, imposed by any department or agency of State government pursuant to any law, or rule or regulation, except that nothing contained in this section shall be interpreted as preventing the imposition of a fee upon a board

of education by either the Department of Education for plan review or by a municipality for the review of plans submitted to it pursuant to the provisions of section 12 of P.L.1975, c.217 (C.52:27D-130).

3.7.1.3 N.J.S.A. 40:55D-8(d), A municipality shall exempt a board of education from the payment of any fee.

3.7.1.4 N.J.S.A. § 52:27d-126e (amended effective 2016) - Waiving of Construction Permit, Enforcing Agency Fees for Certain Construction Projects To Benefit Disabled Persons.

1. a. Notwithstanding the provisions of the "State Uniform Construction Code Act," P.L. 1975, c.217 (C.52:27D-1 19 et seq.), or any rules, regulations or standards adopted pursuant thereto, to the contrary, the governing body of any municipality which has appointed an enforcing agency pursuant to the provisions of section 8 of P.L.1975, c.217 (C.52:27D-126) may, by ordinance, provide that no person shall be charged a construction permit surcharge fee or enforcing agency fee for any construction, reconstruction, alteration or improvement designed and undertaken solely to promote accessibility by disabled persons to an existing public or private structure or any of the facilities contained therein.

The ordinance may further provide that a disabled person, or a parent or sibling of a disabled person, shall not be required to pay any municipal fee or charge in order to secure a construction permit for any construction, reconstruction, alteration or improvement which promotes accessibility to his own living unit.

For the purposes of this subsection, "disabled person" means a person who has the total and permanent inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment, including blindness, and shall include, but not be limited to, any resident of this State who is disabled pursuant to the federal Social Security Act (42 U.S.C.416), or the federal Railroad Retirement Act of 1974 (45 U.S.C.231 et seq.), or is rated as having a 60% disability or higher pursuant to any federal law administered by the United States Veterans' Act. For purposes of this paragraph "blindness" means central visual acuity of 20/200 or less in the better eye with the use of a correcting lens. An eye which is accompanied by a limitation in the fields of vision such that the widest diameter of the visual field subtends an angle no greater than 20 degrees shall be considered as having a central visual acuity of 20/200 or less.

b. (1) Notwithstanding the provisions of the "State Uniform Construction Code Act," P.L. 1975, c.217 (C.52:27D-119 et seq.) or any rules, regulations or standards adopted pursuant thereto to the contrary, the governing body of any municipality which has appointed an enforcing agency pursuant to the provisions of section 8 of P.L. 1975, c.217 (C.52:27D-126) shall not charge a person who has a service-connected disability declared by the United States Department of Veterans Affairs, or its successor, to be a total or 100% permanent disability that

would entitle them to a property tax exemption under section 1 of P.L.1948, c.259 (C.54:4-3.30) or a spouse, parent sibling, or guardian of the disabled veteran, a construction permit surcharge fee or enforcing agency fee for any construction, reconstruction, alteration, or improvement designed and undertaken solely to promote accessibility by the disabled veteran to his own living unit.

(2) A municipality that has granted an exemption from a construction permit surcharge fee or enforcing agency fee pursuant to paragraph (1) of this subsection may apply to the Department of Community Affairs, in accordance with rules and regulations promulgated by the Commissioner of Community Affairs for this purpose, for reimbursement of those exempt fees.

- B. Utility Connection Fees: Contractors shall pay utility connection fees and shall be reimbursed by Owner upon presentation of receipt for same.
- C. Certificates of Occupancy: Contractors shall be responsible for obtaining all Certificates of Occupancy.

1.4 TIME INCLUDING COMPLETION

- A. Supplement Article 8 "Time" as follows:

8.1.7 The term "completed" in N.J.S.A. 18A:18A-19 shall mean substantial completion as defined in this Article 8.

8.1.8 The term "Working Days" as used to compute the time of completion shall mean Mondays through Fridays, exclusive of the twelve major yearly holidays, as listed on the official State of New Jersey website, <https://www.state.nj.us/nj/about/facts/holidays/>

- B. Supplement Article 8.3 "Delays and Extension of Time" as follows:

8.3.4 The Contractor agrees that the Owner can deduct from the Contract Price, any wages paid by the Owner to any Inspector or Inspectors necessarily employed by the Owner for any number of days in excess of the number of days allowed in the specifications for completion of the work.

1.5 NONDISCRIMINATION AND MISCELLANEOUS LABOR PROVISIONS

- A. Attention is called to the following which supplement paragraph 13.1 "Antidiscrimination Provisions" as follows:

13.1.3 N.J.S.A. 10:2-1, Antidiscrimination provisions. Every contract for or on behalf of the State or any county or municipality or other political subdivision of the State, or any agency of or authority created by any of the foregoing, for the construction, alteration or repair of any public building or public work or for the acquisition of

materials, equipment, supplies or services shall contain provisions by which the contractor agrees that:

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

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

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

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

No provision in this section shall be construed to prevent a board of education from designating that a contract, subcontract or other means of procurement of goods, services, equipment or construction shall be awarded to a small business enterprise, minority business enterprise or a women's business enterprise pursuant to P.L.1985, c.490 (C.18A:18A-51 et seq.).

During the performance of this contract, the contractor agrees to Mandatory Equal Employment Opportunity Language, as shown Exhibit B.

13.1.3 N.J.S.A. 34:11-56.25 et seq., in accordance with which the Contractor(s) and subcontractor(s) are required to do the following:

.1 Pay to all workers engaged in the performance of services directly upon the work not less than the prevailing rate of wages. In the event that it is found that any worker employed by the Contractor(s) or any subcontractor(s) has been paid a

rate of wage less than the prevailing wage required to be paid by such contract, the Owner 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.

- .1 Prime Contractor(s) shall post the New Jersey Department of Labor and Workforce Development - Prevailing Wage Rate Determination in accordance with N.J.S.A. 34:11-56.25 et seq., which establish and enforce a prevailing wage level for workers engaged in the project, based on the effective date where the contract(s) is/are to be awarded. This document is to be posted in a prominent and easily accessible place at the site of the work and at such a place or places as are used to pay workers their wages. The prevailing wage rates shall be incorporated into the bid specification manual as a reference and part of the contract. A copy of the project's prevailing wage rates, as applicable to this Project, are on file at the Architect's office.
- .2 Before final payment, furnish Owner with an Affidavit stating that all workers have been paid in accordance with the New Jersey Prevailing Wage Act.
- .3 Keep an accurate record showing the name, craft or trade and actual hourly rate of wages paid to each workman employed by him/her in connection with his/her work. Preserve records for 2 years from date of payment.
- .4 Upon request, the Contractor(s) and each Subcontractor shall file written statements certifying to the amounts then due and owing to any and all workers for wages due on account of the work. The statement shall set forth the names of the persons whose wages are unpaid and the amount due to each. These statements shall be verified by the oaths of the Contractor(s) or subcontractor(s), as the case may be.

1.6 AMERICANS WITH DISABILITIES ACT; FACILITIES FOR PERSONS WITH DISABILITIES

- A. The contractor must comply with all provisions of Title II of the Americans with Disabilities Act (ADA), P.L. 101-336, in accordance with 42 U.S.C. §121.01 et seq. The Board of Education further recognizes that all specifications for the construction, remodeling or renovation of any public building shall provide facilities for persons with disabilities. Reference: N.J.S.A. 18A:18A-17.
- B. It is further recommended that bidders are required to read the Americans with Disabilities language form that is included in these specifications. The form shall be signed to show agreement with the provisions of Title II of the Act and the provisions are to be made a part of the contract. The signed form shall be submitted with the bid proposal. The contractor is obligated to comply with the Act and to hold the owner harmless.

1.7 AMERICAN GOODS AND PRODUCTS

- A. Supplement Paragraph 13.1 "Governing Law" as follows:

13.1.5 N.J.S.A. 18A:18A-20 et seq., American goods and products to be used where possible. Each board of education shall provide as a condition of the Contract that only manufactured and farm products of the United States, where ever available, be used in the work.

1.8 REQUIREMENTS FOR PUBLIC SCHOOLS

- A. Supplement Paragraph 13.1 "Governing Law" as follows:

13.1.6 N.J.S.A. 18A:18A-1 et seq., providing for certain requirements concerning contracts, plans, specifications, etc., for public schoolhouse construction.

1.9 PAYMENTS TO LISTED SUBCONTRACTORS UNDER SINGLE OVERALL CONTRACT

- A. Supplement Paragraph 13.1 "Governing Law" as follows:

13.1.6 N.J.S.A. 18A:18A-18, providing that under a single overall contract, all payment required to be made for work and materials supplied by the various subcontractors shall, upon certification by the Prime Contractor of the amount due to the subcontractor(s), be paid directly to the subcontractor(s).

1.10 POLITICAL CONTRIBUTION DISCLOSURE FORM

- A. In accordance with N.J.S.A. 19:44A-20.26 "pay to play," Contracts exceeding \$17,500.00 are not to be entered into with business entities unless certain disclosures are made about political contributions.

1. In accordance with N.J.S.A. 19:44A-20.26 Contractor shall be required to disclose political contributions made, if any, ten (10) days before entering into Contract in accordance with C.271 form. All bidders must complete this form and submit with Bid Proposal Forms.

- B. In accordance with N.J.A.C. 6A:23A-6.3, No district board of education shall vote upon or award any contract in the amount of \$17,500 or greater to any business entity that has made a contribution reportable by the recipient under P.L. 1973, c. 83 (N.J.S.A. 19:44A-1 et seq.), to a member of the district board of education during the preceding one-year period.

1. Contributions reportable by the recipient under P.L. 1973, c. 83 (N.J.S.A. 19:44A-1 et seq.), to any member of the district board of education from any business entity doing business with the school district shall be prohibited during the term of a contract.

2. The disclosure requirement set forth in section 2 of P.L. 2005, c. 271 (N.J.S.A. 19:44A-20.26) also shall apply when the contract is required by law to be publicly advertised for bids.

1.11 PROMPT PAYMENT ACT

- A. The Owner will issue timely payments to Contractors in accordance with the requirements of the Prompt Payment Act, N.J.S.A. 2A:30A-1, et seq. The bidders are hereby notified that the Owner as a public entity requires all payments to be approved at scheduled public board meetings. The vote on authorization for payments will be made at the first public meeting of the Board following the Board's receipt of the architect's authorization for payment and paid during the subsequent payment cycle.

1.12 NEW JERSEY DEPARTMENT OF TREASURY

- A. Disclosure of Investment Activities in Iran
 1. Pursuant to Public Law 2012, c.25 (N.J.S.A.52:32-55, et. seq.), any person or entity ("bidder") that submits a bid or proposal or otherwise enters into or renews a contract with a board of education is required to disclose if it is engaged in investment activities in Iran. In order to comply with the provisions of P.L. 2012, c. 25, all bidders are required to complete a certification that attests that neither the bidder, nor any of its parents, subsidiaries and/or affiliates is listed on the list developed by the New Jersey Department of Treasury's List of Persons or Entities Engaging in Prohibited Investment Activities in Iran, pursuant to section 3 of P.L.2012, c. 25 (N.J.S.A. 52:32-57). The Department of Treasury List is available at <http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf>. A copy of the list is attached for informational purposes. All bidders are advised to refer to the most current version of the list to ensure compliance with P.L. 2012, c. 25.
 2. If the bidder is unable to certify compliance with the law, the bidder shall provide a detailed and precise description of such investment activities as described in N.J.S.A. 52:32-56(f).
 3. If the board determines that a person or entity submits a false certification concerning its engagement in investment activities in Iran under section 4 of P.L.2012, c.25 (C.52:32-58), the board shall report to the New Jersey Attorney General the name of that person or entity. The Attorney General shall determine whether to bring a civil action against the person or entity to collect the penalty prescribed in paragraph (1) of subsection a. of section 5 of P.L.2012, c.25 (C.52:32-59).
- B. C.18A:18A-49.4 Civil action brought on behalf of Board of Education.
 1. 8.a. A Board of Education as defined in and subject to the provisions of the "Public School Contracts Law," P.L. 1977, c.114 (N.J.S.A. 18A:18A-1 et seq.), shall

implement and comply with the provisions of P.L.2012, c.25 (C.52:32-55 et al.), except that the Board shall rely on the list developed by the State Department of the Treasury pursuant to section 3 of P.L.2012, c25 (C.52:32-57).

2. 8.b. If the Board determines that a person or entity has submitted a false certification concerning its engagement in investment activities in Iran under section 4 of P.L.2012, c.25 (C.52:32-58), the Board shall report to the New Jersey Attorney General the name of that person or entity, and the Attorney General shall determine whether to bring a civil action against the person to collect the penalty prescribed in paragraph (1) of subsection a. of section 5 of P.L.2012, c.25 (C.52:32-59). The Board may also report to the Board's attorney the name of that person, together with its information as to false certification, and the Board's attorney may determine to bring such civil action against the person to collect such penalty.

1.13 EQUAL EMPLOYMENT OPPORTUNITIES AND AFFIRMATIVE ACTION

- A. Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27 et seq.
- B. Initial Project Workforce Report - Construction (AA201)
 1. In accordance with the requirements of the New Jersey Department of Labor & Workforce Development Construction EEO Compliance Monitoring Unit, the Initial Project Workforce Report-Construction(AA201)document, must be submitted to the Public Agency that awards the contract and the Department of Labor & Workforce Development Construction EEO Compliance Monitoring Program after notification of award, but prior to signing the contract.

https://www.nj.gov/treasury/contract_compliance/documents/pdf/guidelines/pa.pdf

1.14 OFFICE OF THE STATE COMPTROLLER

- A. N.J.A.C 17:44-2.2: Authority to Audit or Review Contract Records
 1. Relevant records of private vendors or other persons entering into contracts with covered entities are subject to audit or review by the Office of the State Comptroller (OSC) pursuant to N.J.S.A. 52:15C-14(d).
 - a. (The contract partner) shall maintain all documentation related to products, transactions or services under this contract for a period of **five (5) years** from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.
- B. Contractor/Vendor Requirements-Office of the New Jersey State Comptroller
 1. Contractors/vendors doing business with the board of education are reminded

of the following legal requirements pertaining to the Office of the New Jersey State Comptroller:

a. Access to Relevant Documents and Information - N.J.S.A. 52:15C-14 (d)

- 1) Private vendors or other persons contracting with or receiving funds from a unit in the Executive branch of State government, including an entity exercising executive branch authority, independent State authority, public institution of higher education, or unit of local government or board of education shall upon request by the State Comptroller provide the State Comptroller with prompt access to all relevant documents and information as a condition of the contract and receipt of public monies. The State Comptroller shall not disclose any document or information to which access is provided that is confidential or proprietary. If the State Comptroller finds that any person receiving funds from a unit in the Executive branch of State government, including an entity exercising executive branch authority, independent State authority, public institution of higher education, or unit of local government or board of education refuses to provide information upon the request of the State Comptroller, or otherwise impedes or fails to cooperate with any audit or performance review, the State Comptroller may recommend to the contracting unit that the person be subject to termination of their contract, or temporarily or permanently debarred from contracting with the contracting unit.

b. Maintenance of Contract Records - N.J.A.C. 17:44-2.2

- 1) Relevant records of private vendors or other persons entering into contracts with covered entities are subject to audit or review by OSC pursuant to N.J.S.A. 52:15C-14(d).
- 2) The contractor/vendor to whom a contract has been awarded, 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.

1.15 ANTI-BULLYING BILL OF RIGHTS ACT (P.L. 2010.C.122)

A. Section 4 of P.L.2002, c.83 (C.18A:37-16) is amended to read as follows:

1. N.J.S.A. 18A:37-16 Reprisal, Retaliation, False Accusation Prohibited

- 4.a. A member of a board of education, school employee, student or volunteer shall not engage in reprisal, retaliation or false accusation against a victim, witness or one with reliable information about an act of harassment, intimidation or bullying.

- b. A member of a board of education, school employee, contracted service provider, student or volunteer who has witnessed, or has reliable information that a student has been subject to, harassment, intimidation or bullying shall report the incident to the appropriate school official designated by the school district's policy, or to any school administrator or safe schools resource officer, who shall immediately initiate the school district's procedures concerning school bullying.
- c. A member of a board of education or a school employee who promptly reports an incident of harassment, intimidation or bullying, to the appropriate school official designated by the school district's policy, or to any school administrator or safe schools resource officer, and who makes this report in compliance with the procedures in the district's policy, is immune from a cause of action for damages arising from any failure to remedy the reported incident.
- d. A school administrator who receives a report of harassment, intimidation, or bullying from a district employee, and fails to initiate or conduct an investigation, or who should have known of an incident of harassment, intimidation, or bullying and fails to take sufficient action to minimize or eliminate the harassment, intimidation, or bullying, may be subject to disciplinary action.

L.2002, c.83, s.4; amended 2010, c.122, s.13.

1.16 CONTROLLING SILICA EXPOSURES IN CONSTRUCTION

- A. Occupational Safety and Health Administration (OSHA) - U.S. Department of Labor: OSHA 29 CFR 1926.1153, 2017.
 - 1. The above referenced guidance advisory document is not a standard or regulation, and it creates no new legal obligations. The document is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with safety and health standards promulgated by OSHA or by a state with an OSHA approved state plan. In addition, pursuant to Section 5(a)(1), the General Duty Clause of the Act, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take reasonable steps to prevent or abate the hazard. However, failure to implement any specific recommendations contained within this document is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.
 - a. This guidance document addresses the control of employee exposures to respirable dust containing crystalline silica, which is known to cause silicosis,

a serious lung disease, as well as increase the risk of lung cancer and other systemic diseases.

- b. This document provides information on the effectiveness of various engineering control approaches for several kinds of construction operations and equipment, and contains recommendations for work practices and respiratory protection, as appropriate.
 - c. OSHA encourages employers to conduct periodic exposure monitoring to confirm that engineering and work practice controls are effective and that appropriate respiratory protection is being used where necessary.
2. The above referenced advisory document can be found at:
https://www.osha.gov/dsg/topics/silicacrystalline/construction_info_silica.html

END OF SECTION 00860

SECTION 00870 - MISCELLANEOUS REQUIREMENTS

PART 1 - GENERAL

1.1 JOB SITE MEETINGS

- A. Regularly scheduled job meetings shall be held at a location and time convenient to the Owner's representatives, the Architect and the Contractor. The Prime Contractor shall attend such meetings, or be represented by a person in authority who can speak for and/or make decisions for the Contractor.
- B. Attendance by the Contractor is mandatory, whether the meetings are weekly, bi-weekly or at whatever interval is determined by the Architect.
 - 1. Unless given prior approval by the Architect, the Prime Contractor will be fined \$250.00 for each regularly scheduled meeting for which he/she is not presented by a person in authority who can speak for and/or make decisions for the Contractor. Fine amounts shall be withheld and deducted from the Contract Sum.

1.2 STRUCTURAL SAFETY STANDARDS AND CODES

- A. The standards, codes and design data referred to in the New Jersey "State Uniform Construction Code", apply to the work of the Contract, where applicable.
- B. Contractor shall comply with all applicable requirements of the Uniform Fire Safety Act, N.J.S.A. 52:27D-192 et seq.

1.3 OWNER'S RIGHT TO OCCUPY

- A. The Owner reserves the right to occupy any portion of the Project which is ready for occupancy prior to completion and acceptance of the Project, after Local Municipal Construction Enforcing Agency approval.
- B. The occupancy of any portion of the Project does not constitute an acceptance of any work nor does it waive the Owner's right to liquidated damages or constitute an acceptance of any work as the Project will be accepted as a whole and not in units. Prior to such occupancy, however, the Architect, a representative of the Owner, and the Contractor shall fully inspect the portions of the Project to be occupied, preparing a complete list of omissions of materials, faulty workmanship, or any items to be repaired, torn out or replaced. The Owner will assume responsibility for damage to premises so occupied of any items not on this list when such damage is due to greater than normal wear and tear, but does not assume responsibility for improper or defective workmanship or materials.

1.4 OWNER'S GENERAL REQUIREMENTS

- A. The Owner requires that the Contractor demonstrate a safety and health program/plan, which includes, but is not limited to first aid, fire protection, housekeeping, illumination, sanitation, personal protective equipment, medical, exit, emergency action plans and all other issues required by government agencies having jurisdiction over the work of this project.
- B. The following Owner's General Requirements shall be enforced during construction and until final completion of the work:
 - 1. No deliveries of construction materials or equipment is to take place during the arrival and departure of students from their respective schools. Verify and coordinate arrival and departure time with the Principals.
 - 2. All construction materials and equipment shall be stored behind the construction fence.
 - 3. No smoking on any of the School's Property.
 - 4. All workers must wear shirts at all time.
 - 5. Use of profanity will not be tolerated.
 - 6. The Prime Contractor shall provide identification cards for his/her subcontractors, employees, etc.
 - 7. The Contractor shall comply with the requirements of all local ordinances including for noise.
 - 8. The Contractor and his/her subcontractors shall not interact with students or staff, other than those identified by the Owner as a representative of the Owner.

1.5 ENVIRONMENTAL PROTECTION

- A. Conform to New Jersey Department of Environmental Protection Regulations N.J.A.C. 7:27, sub-chapters 5 and 7 and all other applicable standards.
- B. Conform to New Jersey Statute N.J.S.A. 26:2C-9.2 which requires that no person shall construct, install, alter or operate any equipment capable of causing the emission of air contaminants into the open air or control apparatus which prevents or controls the emission of air contaminants until an application has been filed with and approved by the Department of Environmental Protection.

1.6 SOIL EROSION AND SEDIMENT CONTROL

- A. Compliance with soil erosion and sediment control will be strictly enforced. Failure

to conform to specified sequence of soil erosion and sediment control will result in imposition of penalties as levied by local soil conservation district, and withholding of payments for work not performed in accordance with soil erosion sequence.

1.7 CERTIFIED PAYROLLS

- A. Pursuant to N.J.S.A. 12:60-5.1(C)(1)(l), the Contractor shall furnish to the Owner certified payroll records each payroll period within ten (10) days of the payment of wages, indicating name, craft, social security number and actual hourly rate of wages paid to each worker employed on the project. A certified payroll record is defined as "a payroll record which is attested to by the employer, or a corporate officer of such company, or an authorized agent of the employer."

1.8 OPERATION AND MAINTENANCE

- A. Contractor shall furnish to the Owner all required operation and maintenance manuals for all included materials and equipment as well as assistance and training to the Owner's personnel for contract's special systems and equipment in accordance with Contract Documents.
 - 1. Contractor shall submit electronic version of the MEPFP O&M Manuals for review by the MEP/FP Consultant. Paper copies should not be submitted as part of the MEP/FP review process.

END OF SECTION 00870

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 SUMMARY

- A. Section Includes:
 - 1. Project description.
 - 2. Contract scope description.
 - 3. Contractor's use of the premises.
 - 4. Preconstruction meeting.
 - 5. Security procedures.

1.3 PROJECT DESCRIPTION

- A. The project consists of the Renovations for Security Vestibule at Pomona Preschool and Arthur Rann Elementary School for the Galloway Township School District, Board of Education, Atlantic County, New Jersey.
- B. Contract Documents prepared by Fraytak Veisz Hopkins Duthie, P.C. Architects / Planners, (Project Number: FVHD-5192 / 5193) and their Consulting Engineers:
 - 1. Consulting Civil Engineer: Edwards Engineering Group, Inc., Somerville, NJ.
 - 2. Consulting Mechanical/Electrical Engineer: Gillan & Hartmann, Inc., Mont Clare, PA.

1.4 CONTRACT SCOPE DESCRIPTION

- A. The work consists of but is not limited to the following:
 - 1. Pomona Preschool, FVHD-5192:
 - a. Provide and install new masonry wall opening for transaction window in a hollow metal frame with security window film and fire rated counter shutter/stainless steel counter, and associated work where indicated on the drawings.
 - b. Provide and install a stair landing extension and all associated work at the secure vestibule in front of the transaction window.

- c. Provide and install security window film on existing doors, where indicated on the drawings.
 - d. Provide and install new solid core wood doors, vision panels, security window film, hollow metal frames, hardware and associated work where indicated on the drawings.
 - e. Provide and install impact resistant gypsum board and framing and associated work at stair wall infill.
 - f. Provide and install carpet entry mat (CEM) at the secure landing, as indicated on the drawings.
 - g. All mechanical and electrical systems, as indicated on the drawings.
 - h. All other indicated work.
2. Arthur Rann Elementary School, FVHD-5193:
- a. Remove and replace the exterior aluminum storefront system and exterior doors with new storefront system, FRP doors, insulated laminated glass with security window film, door hardware and all associated work as indicated on the drawings.
 - b. Remove and replace the secure vestibule concrete floor slab in its entirety and include perimeter insulation, vapor barrier, and carpet entry mat (CEM) as indicated on the drawings.
 - c. Provide and install new exterior concrete plaza, steps, aluminum railings, barrier-free ramp and associated work, as indicated on the drawings.
 - d. Provide and install new masonry wall opening for transom window in a hollow metal frame with security window film and fire rated counter shutter/ stainless steel counter, and associated work where indicated on the drawings.
 - e. Provide and install new solid core wood doors, vision panels, security window film, hollow metal frames, hardware and associated work where indicated on the drawings.
 - f. All mechanical and electrical systems, as indicated on the drawings.
 - g. All other indicated work.
3. Alternate Bid(s):
- a. Arthur Rann Elementary School:
 - 1) Alternate Bid 1: Entrance Canopy & Associated Work

- B. Single Overall Contract: This contract includes:
1. All work in accordance with drawings, Parts 2, 3, 5 and 6 Specification Sections and in accordance with Contract Documents.
 2. General Construction Work includes:
 - a. Work that is primarily architectural and civil in nature plus work traditionally recognized as general construction in accordance with drawings and as listed as a part of Part 2 specification sections, unless otherwise indicated below:
 - 1) Also includes both administrative and coordination responsibilities.
 - a) General Construction Contractor is responsible for all coordination between his/her work and work of all Subcontractors.
 - 2) All initial excavation inside the building, and the preparation of the subbase under the concrete slab.
 - 3) All earthwork, site utility work outside the building, as specified in Part 2 specification sections.
 - a) **Site utility work and include final utility connections and obtaining permits from all authorities having jurisdiction.**
 - 4) All Concrete work in accordance with Part 2 specification sections excluding concrete pads shown on mechanical and electrical drawings for mechanical and electrical work.
 - 5) Provide and install the miscellaneous Structural Steel.
 - 6) Provide and install the metal fabrications, aluminum handrails and railings and in accordance with Division 2 Sections.
 - 7) Perform all existing roof cutting, alterations, repair, replacement and flashing work associated with General Construction Work, where indicated or required.
 - a) Roofing work shall be performed in accordance with requirements of existing roofing system warranty and in accordance with the Contract Documents.
 - b) Coordination of all required structural framing and supports for mechanical and electrical work, whether shown or not.
 3. Structural and Miscellaneous Steel Work includes:
 - a. Fabrication and erection of structural steel, framing, metal deck, steel stair landing, steel handrails and railings and miscellaneous metal fabrications in accordance with Part-3 specification sections.
 4. Heating, Ventilating, Air Conditioning and Refrigeration Work includes:
 - a. Heating, ventilating, and air conditioning systems as well as the temperature control systems and including all work in accordance with drawings and Part-5 specification sections.

- 1) Work shall include demolition and removals as indicated or required to allow for new construction.
 - 2) Work shall include reinstallation, cutting, patching, finishing and repair work associated with HVACR work, as indicated or required including performing work at existing roofs; cutting existing roof decking, provide and install structural steel support, and all other roof flashing work where indicated or required.
 - a) Furnishing and installing all required structural framing and supports for roof top mechanical equipment at existing buildings whether shown or not.
 - b) Structural framing shall be as per typical roof framing conditions as shown on the drawings and/or as per approved shop drawings by the Architect.
 - c) Roofing work shall be performed in accordance with requirements of existing roofing system's warranty and the Contract Documents.
 - b. Subsequent excavation, backfill and compaction of trenches after the work of the General Construction above, as required by the installation of mechanical utilities inside the building. Work shall be performed in accordance with requirements of Part-2 Specification sections.
 - c. Concrete pads shown on mechanical drawings for mechanical work. Work shall be performed in accordance with requirements of Section 03300.
5. Electrical Work includes:
- a. The work necessary for electrical power distribution, lighting, and the connections to equipment tied into such systems and including all work in accordance with drawings and Part-6 specification sections.
 - 1) **Work shall include power distribution and wiring for all indicated electrically operated equipment and fixtures, (in Parts 2, 5 and 6), whether shown or not on drawings.**
 - 2) Work shall include demolition and removals as indicated or required to allow for new construction.
 - 3) Work shall include reinstallation, cutting, patching, finishing and repair work associate with Electrical work and as indicated or required including performing work at existing roof(s); cutting existing roof decking, and all other roof flashing work:
 - a) Roofing work shall be performed in accordance with requirements of existing roofing system's warranty and the Contract Documents.
 - b. Subsequent excavation, backfill and compaction of trenches after the work of the General Construction, above, as required by the installation of electrical utilities inside the building. Work shall be performed in accordance with requirements of Part-2 Specification sections.

- c. Concrete pads shown on electrical drawings for electrical work. Work shall be performed in accordance with requirements of Section 03300.
- d. **Work shall be up to 5' outside the building line, unless indicated otherwise in the Contract Documents, and include final utility connections and obtaining permits from all authorities having jurisdiction.**

1.5 CONTRACTOR'S USE OF THE PREMISES

- A. The space available to the Contractor for the performance of the work, either exclusively or in conjunction with others performing other construction as part of the project, is shown on the drawings.
 - 1. Other areas are off limits to all construction personnel.
- B. The following building facilities may not be used by construction personnel:
 - 1. Toilet facilities.
 - 2. Food service facilities, including dining areas.
- C. The Owner will partially occupy the building(s) during the construction period.
 - 1. The Owner will endeavor to cooperate with the Contractor's operations when the Contractor has notified the Owner in advance of need for changes in operations in order to accommodate construction operations.
 - 2. Conduct the work so as to cause the least interference with the Owner's operations.
- D. Coordinate with Local Authorities as to which routes are capable of handling heavy truck traffic.
- E. Signs: Provide signs adequate to direct visitors.
 - 1. Do not install, or allow to be installed, signs other than specified sign(s) and signs identifying the principal entities involved in the project.
- F. All deliveries by the Contractor(s) shall be coordinated with the Owner's Representative, prior to the delivery date.

1.7 PRECONSTRUCTION MEETING

- A. A preconstruction meeting will be held at a time and place designated by the Architect for the purpose of identifying responsibilities of the Owner's / Architect's personnel and explanation of administrative procedures.

B. The Contractor shall also use this meeting for the following minimum agenda:

1. Construction schedule.
2. Use of areas of the site.
3. Delivery and storage.
4. Safety.
5. Security.
6. Cleaning up.
7. Subcontractor procedures relating to:
 - a. Submittals.
 - b. Change orders.
 - c. Applications for payment.
 - d. Record documents.

C. Attendees shall include:

1. The Owner / Owner's Representative.
2. The Architect, and any Consultants.
3. The Prime Contractor and his / her superintendent(s).
4. Major subcontractors, suppliers, and fabricators.
5. Others interested in the work.

1.8 SECURITY PROCEDURES

- A. Limit access to the sites and buildings to persons involved in the work.
- B. Provide secure storage for materials for which the Owner has made payment and which are stored on site.
- C. Secure completed work as required to prevent loss.
- D. The Contractor, and their employees / Subcontractors will be required to be registered with the Owner's Representative / School's Main Office.
 1. The Contractor's personnel and Subcontractors will be required to wear identification badges at all times on the site.

END OF SECTION 01010

SECTION 01020 - ALLOWANCES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

- A. Definitions and Explanations: Certain requirements of the work related to each allowance are shown and specified in the contract documents. The allowance has been established in lieu of additional requirements for that work, and further requirements thereof (if any) will be issued by change order.
- B. The types of allowances scheduled herein for the work include the following:
1. Lump sum allowances.
- C. Selection and Purchase: At the earliest feasible date after the award of the Contract, advise the Architect of the scheduled date when the final selection and purchase of each product or system described by each Allowance must be accomplished in order to avoid delays in the performance of the work. Obtain and submit proposals for the work of each Allowance, as required by the Architect for use in making the final selections; include whatever recommendations for selection may be relevant to the proper performance of the work. Purchase products and systems as specifically selected (in writing) by the Architect.
1. Submit proposals and recommendations, for the purchase of the products or systems of Allowances, in the form specified for change orders.
- D. Change Order Data: Where applicable, include in each change order proposal both the quantity of the products being purchased and the unit cost, along with the total amount of the purchase to be made. Where requested, furnish survey-of-requirements data to substantiate the quantity. Indicate applicable taxes, delivery charges, and amounts of applicable trade discounts.
- E. Lump-Sum Allowances: The amounts herein specified are the net amounts available for purchase of the materials specified, including taxes (if any), and each change order amount shall be based thereon. **All other costs associated with the performance of the work under the Allowance, including but not limited to insurance, storage, handling, overhead, profit, etc., are not a part of the allowance, and shall be included in the lump sum bid / or base bid Contract amount.**
1. In the event the actual purchase amount of materials, plus taxes (if any) exceeds the specified allowance, the Owner will pay the excess; should the actual purchase amount, plus taxes (if any) be less than the specified Allowance, the Contractor shall credit the Owner with the difference.
 2. The actual purchase amount, plus taxes (if any) shall be substantiated by certified bills of sale to be submitted with the change order.

- F. Change Order Mark-Up: Except as otherwise indicated, comply with the provisions of the General Conditions and the Supplementary General Conditions.
- G. Excess Materials: Submit invoices or delivery slips to indicate the actual quantities of materials delivered to the site for use in fulfillment of each allowance. Where economically feasible, and so requested by the Architect, return unused materials to the manufacturer/supplier for credit to the Owner, after the installation has been completed and accepted. Where not economically feasible to return for credit, and so requested by the Architect, prepare unused materials for the Owner's storage, and delivery to the Owner's storage space as directed. Otherwise, disposal of excess materials is the Contractor's responsibility.

1.2 SCHEDULE OF ALLOWANCES

- A. General: The following allowance amounts are included in the Contract Sum, for the corresponding units of work as described.
 - 1. General Construction Work
 - a. A sum of **\$3,000.00** for work not specifically shown on the drawings, the work shall be performed as directed in the field.
 - 2. Structural and Miscellaneous Steel Work (**Alternate Bid Only**)
 - a. A sum of **\$2,500.00** (½ ton of steel @ \$5,000.00 per ton) for additional fabricated and erected steel as defined by and specified in Section 05120, Structural Steel.
 - 3. Plumbing and Drainage Work
 - a. A sum of **\$1,000.00** for work not specifically shown on the drawings, the work shall be performed as directed in the field.
 - 4. Heating Ventilating and Air Conditioning Work
 - a. A sum of **\$1,000.00** for work not specifically shown on the drawings, the work shall be performed as directed in the field.
 - 5. Electrical Work
 - a. A sum of **\$2,000.00** for work not specifically shown on the drawings, the work shall be performed as directed in the field.

END OF SECTION 01020

SECTION 01030 - ALTERNATE BIDS

PART 1 - GENERAL

1.1 PROCEDURE FOR ALTERNATE BIDS

- A. Each Bidder shall submit on the Proposal Form, all Alternate Bids applicable to the work under his/her bid. Alternate Bids shall state the difference in price as "additions to" or "deductions from" the Base Bid, unless otherwise noted, for the substitution, omission, or addition of the following materials, items or construction from that shown and specified.
- B. The Alternate Bids, when accepted, become part of the Contract.
- C. Each Bidder shall carefully check the Drawings and Specifications to determine the extent of each Alternate Bid required.
- D. Alternate Bids shall include all overhead and profit applicable thereto.
- E. Alternate Bids shall reflect the increase or decrease in cost of all work of every name and nature which may be affected thereby and no subsequent claims for extras by reason of the Contractor's failure to observe this requirement will be considered.
- F. The description herein for each Alternate Bid is recognized to be incomplete and abbreviated, but implies that each change must be complete for the scope of work affected. Refer to applicable specification sections and to applicable drawings, for specific requirements of the work, regardless of whether references are so noted in description of each Alternate Bid. Coordinate related work and modify surrounding work as required to properly integrate with the work of each Alternate Bid. It is recognized that descriptions of Alternate Bids are primarily scope definitions, and do not necessarily detail full range of materials and processes needed to complete the work as required.
- G. Except as otherwise described or approved, materials and workmanship of the Alternate Bids shall conform to the requirements specified under the various sections of the Specifications for similar items of work.
- H. Where methods of construction, materials, finishes or details of installation required by the various Alternate Bids differ from the requirements shown on the drawings or specified for corresponding items, the alternate construction, materials, etc. will be subject to approval by the Architect.
- I. The Contractor shall submit shop drawings and samples for the work under each accepted Alternate Bid for approval in conformance with requirements specified for submittals in both Part 1, AIA Document A201 and Section 00800 - Supplementary General Conditions.

- J. The following Alternate Bids shall apply to single overall bids, and must be included in the Bidder's Proposal(s).

1.2 ALTERNATE BIDS

A. Alternate Bid No. 1: Entrance Canopy & Associated Work

State the amount to be added to the base bid to provide and install the entrance canopy, masonry piers, lighting, metal letters and all other associated work, as shown on various drawings and as indicated in various specification sections.

END OF SECTION 01030

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 REQUIREMENTS INCLUDED

- A. Coordination of submittals.
- B. Coordination meetings.
- C. Coordination drawings.
- D. Coordination of project closeout.
- E. Administrative/supervisory personnel.
- F. Coordination of trades.
- G. Coordination of space.
- H. Coordination of field measurements and field conditions.

1.3 GENERAL REQUIREMENTS

- A. The Prime Contractor shall coordinate his/her activities with the activities of other Subcontractors and work performed by others.
- B. If necessary, inform each party involved, in writing, of procedures required for coordination; include requirements for giving notice, submitting reports, and attending meetings.
 - 1. Inform the Architect when coordination of his/her work is required.

1.4 COORDINATION OF SUBMITTALS

- A. Coordinate and correlate the submittals on each work item and on interrelated work items to ensure their timeliness, completeness, consistency, compatibility and compliance with the Contract Documents.
- B. Prepare and submit special coordination drawings where close and careful coordination of information is required for proper fabrication or installation of

materials, products or equipment by separate entities. Coordination drawings may also be required where limited space availability necessitates close and careful coordination for efficient and proper installation of different components.

1. Show interrelationships of components shown on separate shop drawings.
 2. Indicate required installation sequences.
 3. (See also the requirements for the general coordination drawings under paragraph 1.7 below).
- C. Coordinate any request for substitution to ensure compatibility of its space requirements, its operating characteristics and elements and its effects on other work. Prior to proposing a substitution for any item, verify that its size, configuration, supports and connections will coordinate with all other work and that it will fit within the allotted space while allowing for proper operating, maintenance and circulation space.
- D. Comply with requirements for requests for submittal of substitution indicated in AIA A201 and Section 00800.

1.5 COORDINATION MEETINGS

- A. The General Construction Work Contractor shall hold additional coordination meetings and conferences with Subcontractors and others involved in the Work as needed to ensure coordination of work.
1. Notify the Architect of such coordination meetings.
- B. Regular project site meetings shall be in accordance with Sections 00870 and 01200.

1.6 COORDINATION OF TRADES

- A. Coordinate construction activities included under various sections of these Specifications to ensure efficient and orderly installation of each part of the Work and to prevent interferences among parts of the Work. Coordinate work items and construction operations included under different sections of the Specifications that are dependent upon one another for proper installation, connection and operation.
1. Where installation of one part of the Work is interrelated with installation of other components, schedule construction activities in the sequence required to obtain the best results.
 2. Where availability of space is limited, coordinate installation of different components to prevent interferences and to ensure proper accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda outlining special procedures required for coordination. Include such items as required notices, reports and attendance at meetings. Distribute these coordination memoranda to all parties involved in the work being coordinated.
1. Prepare similar memoranda for the Owner and other Contractor(s) where coordination with construction or operations by them is required.
 2. Provide copies of such coordination memoranda to the Architect.
- C. Coordinate the scheduling and timing of required administrative activities with other construction activities to avoid conflicts and ensure orderly progress of the Work. Administrative activities include:
1. Preparation and updating of schedules.
 2. Preparation and processing of submittals.
 3. Preparation and processing of requests for information.
 4. Project meetings.
 5. Testing and inspection activities.
 6. Project close-out activities.

1.7 COORDINATION DRAWINGS

- A. General Requirements: Prepare coordination drawings where limited space available may cause conflicts in the locations of installed products, and where required to coordinate installation of products.
1. In preparing the coordination drawings, large scale details as well as cross and longitudinal sections shall be developed as required to fully delineate all conditions. Particular attention shall be given to the locations, size and clearance dimensions of equipment items, shafts and similar features.
 2. In preparing the coordination drawings, minor changes in duct, pipe or conduit routing that do not affect the intended functions may be made as required to avoid space conflicts, when mutually agreed, but items may not be resized or exposed items relocated or other features affecting the function or aesthetic effect of the building changed without the Architect's prior review and acceptance. It should be assumed that no changes shall be made in any wall or chase locations, ceiling heights, door swings or locations, or window or other openings. If conflicts or interferences cannot be satisfactorily resolved, then the Architect shall be notified and their determinations obtained. Any conflicts or design deviations shall be specifically identified on drawings submitted to them.

3. The coordination drawings shall be submitted, in all cases, in ample time to avoid construction delay. The coordination drawings submitted may lack complete data in certain instances pending receipt of shop drawings, but sufficient space shall be allotted for the items missing, as evidenced by the sign-off of the party responsible for the missing items. When the missing information is available, it shall be promptly incorporated in the composite drawings.
 4. Cost and time impacts of relocating any duct, pipe, conduit, or other material that has been installed without proper coordination between all trades involved will be charged to the responsible party. If any improperly coordinated work or work installed that is not in conformance with the approved coordination composites necessitates additional work, the cost and time impacts of all such additional work shall likewise be the responsibility of the affective party. The Architect shall be the sole judge in determining all responsibilities.
 5. All changes in the scope of work due to revisions formally issued and approved shall be shown on the composite drawings.
 6. All work on the coordination drawings shall be performed by a competent draftsmen and shall be clear and fully legible. The Architect shall be the judge of the legibility of the composite drawings.
 7. In particular, prepare the following coordination drawings:
 - a. Drawings showing all piping, duct, cabletrays, electrical ductbanks, and similar items, but not electrical conduit less than 4 inches in diameter.
 - b. Complete architectural, mechanical and electrical reflected ceiling layouts, (including ductwork, conduits, piping, lighting, etc.).
 - c. Special coordination drawings are to be provided for the following:
 - 1) Where space is limited, show plan and cross-section dimensions of space available, including structural obstructions and ceilings as applicable.
- B. The Prime General Contractor shall prepare the coordination drawings required for his/her work.
- C. Layout Drawings: As soon as practical, but in no case starting later than thirty (30) days after the HVACR Work Subcontractor has received the notice to proceed, the HVACR Work Subcontractor shall prepare layout drawings of all duct work and piping at not less than 3/8" scale.
1. These drawings shall show registers, grilles, diffusers and similar features, as well as locations of all units, valves, dampers and other items requiring access for service and maintenance.

2. The drawings shall also show roof, floor and wall openings, reflected ceiling layouts, structural beams, framing and miscellaneous structural steel supports, ceiling heights, walls, floor to floor dimensions, structural columns, doors and other major architectural and structural features as shown on the architectural and structural drawings and as per approved shop drawings.

D. Composite Drawings:

1. The HVACR Work Subcontractor shall, as scheduled by the General Contractor, produce a mylar, two (2) prints and one (1) sepia of each layout drawing as described.
2. The sepia will be retained for his/her records while the mylar and two (2) prints will be formally transmitted to the Electrical Subcontractor, with copies of the transmittal to the Architect.
3. These drawings must be hand delivered or sent via a reliable mailing service that provides receipts and guarantees 24-48 hour delivery.
 - a. Common carrier mailing will not be acceptable.
4. The Electrical Work Subcontractor, upon receipt of these mylars, will transfer the work from his/her shop drawings to the mylars, at the same time indicating where conflicts exist between his/her work and the work already shown on the mylars.
 - a. The Electrical Work Subcontractor will utilize a orange colored pencil for the layout of his/her work.
 - b. After completion the Electrical Contractor will forward the drawings as specified above to the General Contractor, retaining a sepia for his/her records.
5. The General Construction Work Contractor shall then have the HVACR's instrumentation (ATC) Work Subcontractor review the completed composite drawings and attest to his/her concurrence that his/her work can be installed without conflict.
6. The General Construction Work Contractor will schedule coordination meetings on the job site to review the coordination drawings.
 - a. These meetings will be attended by a representative from each of the Subcontractors involved in the coordination process.
 - b. At these meetings, these Subcontractors will indicate where conflicts exist and resolve the conflicts through mutual agreement.

- c. Should an impasse occur, the Architect will determine the resolution.
7. When all conflicts are resolved, the Subcontractors will indicate their agreement by signing these final composite drawings.
8. The drawings shall be signed-off by each of the involved Subcontractors, indicating their awareness of and agreement with the indicated routings and layouts and their interrelationship with the adjoining or contiguous work. The General Contractor shall then sign these final composite drawings.
9. The final composite drawings shall be completed and signed-off by all parties no later than ninety (90) calendar days after the General Construction Work Contractor has received the Notice to Proceed.
 - a. After the final composite drawings have been agreed upon and signed by the Subcontractors or Prime Contractors and by the General Construction Work Contractor, the General Construction Work Contractor shall provide and distribute prints to each of the (Sub)Contractors, and four (4) sets of prints to the Architect for reference and record purposes.
 - b. The record copies of the signed-off final composite drawings shall be retained by the General Construction Work Contractor and each Subcontractor as working reference documents.
 - c. All shop drawings, prior to their submittal to the Architect, shall be compared with these composite drawings and developed accordingly.
 - 1) Any revisions to the composite drawings which may become necessary during the progress of the work shall be noted by the General Construction Work Contractor and by each affected Subcontractor and shall be neatly and accurately recorded on their record copies.
10. The General Construction Work Contractor and each Subcontractor shall be responsible for the up-to-date maintenance of his/her record copies of the composite drawings and for having one up-to-date copy available at the site.
11. The composite drawings, incorporating any subsequent changes thereto, shall be utilized by the General Construction Work Contractor or each Subcontractor in the development of his/her record drawings.
12. Following sign-off of the final composite drawings, no deviations will be permitted without prior review and acceptance by the Architect.
 - a. Unauthorized deviations will be subject to removal and correction at no additional cost to the Owner.

13. In areas where no HVAC work occurs, but where other mechanical and electrical installations are required, each involved Subcontractor shall be responsible for his/her own work and shall cooperate, as directed by the General Construction Work Contractor, in preparing similar layout and composite drawings.

1.8 COORDINATION OF PROJECT CLOSEOUT

- A. Coordinate completion and clean-up work and administrative activities in preparation for Substantial Completion and occupancy of the Work or of designated portions of the Work.
- B. After Owner occupancy, coordinate access for completion or correction of the work not in conformance with the Contract Documents to minimize disruption of Owner's activities.
- C. Assemble and coordinate closeout submittals specified in Section 01700.

1.9 REQUIRED ADMINISTRATIVE / SUPERVISORY PERSONNEL

- A. General: In addition to the other administrative and supervisory personnel required for the performance of the Work, each Prime Contractor shall provide specific coordinating personnel as specified herein.
- B. Project Manager / Superintendent: A full time on site Project Manager, with a recommended minimum of eight (8) years experience, including project management experience on a similar type of projects.
 1. The Contractor for General Construction Work shall provide a full-time staff member or members, (Project Manager/Superintendent), experienced in coordination of mechanical and electrical work on projects of this type and scale, including administration and supervision.
 - a. Responsibilities:
 - 1) Coordinate all mechanical and electrical work, and coordinate that work with the other work of the project.
 - 2) Where space is limited, coordinate arrangement of mechanical, electrical, and other work to fit.
 - 3) Coordinate cutting and patching activities and sequencing.
 - 4) Coordinate use of temporary facilities.
 - b. Prepare coordination drawings where required and where indicated.
 - c. Provide information to the entity preparing the progress schedule.
 - d. Participate in progress meetings; report progress, changes required in schedules, and unresolved problems.

- e. Review submittals for compliance with the contract documents and for coordination with other work.
 - f. Check field dimensions, clearances, relationships to available space, and anchors.
 - g. Check compatibility with equipment, other work, electrical characteristics, and operational control requirements.
 - h. Check motor voltages and control characteristics.
 - i. Coordinate controls, interlocks, wiring of switches, and relays.
 - j. Coordinate wiring and control diagrams.
 - k. Review the effect of changes on other work.
 - l. Obtain and distribute installation data on each item of equipment requiring mechanical or electrical connections; include:
 - 1) Electrical power characteristics.
 - 2) Control wiring requirements.
 - m. Observe and maintain record of tests and inspections.
 - n. Observe work for compliance with contract documents and notify the applicable contractor in writing of observed defects in the work.
 - o. Coordinate and observe startup and demonstration of equipment and systems.
 - p. Coordinate maintenance of record documents.
 - q. Assist the Architect with final inspections.
2. Subcontractor(s) shall provide staff for coordination between trades. Staff requirements noted above represent the minimum full-time on site staff required.
 3. Staffing is subject to Owner / Architect's approvals.
 4. Staff members may not be removed or replaced without Owner/Architect's approvals.
 5. Staff name(s), duties and resumes are to be submitted to the Architect for approval within fifteen (15) days of the Notice to Proceed.

1.10 COORDINATION OF TRADES

- A. Coordinate work with other trades to eliminate any possible interference before any piping, conduit, equipment, devices, controls, supports, ductwork and fixtures are installed.
- B. Where multiple items of mechanical and electrical equipment, devices, piping, conduits, supporting metal work, hangers, pull boxes, outlets, ductwork or controls are shown on any of the Contract Documents of the various trades in the same location, coordinate and adjust items to fit within designated location(s).
- C. Provide and install necessary offsets, bends, turns and modifications in piping, ductwork, conduit and devices required to install the work without interference with that of other trades or structure, without additional cost to the Owner.
- D. For products specified to be furnished by one Contractor and installed by another Contractor:
 - 1. Contractor specified to furnish (or remove) product shall be responsible for delivery to (or return from) the project site, and shall pay transportation costs.
 - 2. Contractor specified to install product shall be responsible for coordinating product delivery, loading or unloading, storing, protecting and installing product as required.

1.11 COORDINATION OF SPACE

- A. Coordinate use of available space and sequence of installation for work (e.g., mechanical and electrical work) which is indicated diagrammatically or schematically on the drawings. Prevent physical interference of components. Follow routing shown for pipes, ducts and conduits, taking into account the limitations of available space; make runs parallel with lines of building. Utilize space efficiently to ensure proper installations (including installation of other work) and accessibility for maintenance, service and repairs.
- B. Detailed drawings of proposed departures from spatial arrangements or locations indicated in the Contract Documents, due to field conditions or other causes, shall be submitted to the Architect for review. No such departures shall be made without prior review by the Architect.
- C. Where required for coordination, the Architect will have the authority to order, as changes in the Work, changes in locations and sizes of piping, ductwork conduit, raceways and ducts. Such changes shall be made without adjustment to the Contract Sum or Contract Time.
- D. Field verify measurements of existing items and work which precedes each sequence. Ensure proper fit and location.

- E. In finished areas, conceal pipes, ducts and wiring in the construction.
- F. Coordinate locations of fixtures and outlets with finish elements.

1.12 COORDINATION OF FIELD MEASUREMENTS AND FIELD CONDITIONS

- A. Prior to ordering materials or equipment or performing work, the Contractor and/or Subcontractors shall verify Contract Document and submittal of dimensions and weights affecting their work and other Contractor's work associated with field measurements and field conditions at the project site, and shall be responsible for their accuracy and correctness.
- B. Differences discovered from dimensions or weights indicated in the Contract Documents or submittals shall be submitted in writing to the Architect for review, before proceeding with the work.
- C. Commencing work implies acceptance of surfaces, areas, preceding work and other field conditions, and verification of dimensions, by the Contractor.
- D. No Change Order will be issued in cases where discrepancies in dimensions are discovered after work has been commenced or where the Contractor has failed to properly investigate and take into account field measurements and existing field conditions.
- E. Inspection of Conditions: Require the Installer of each major component to inspect both substrate and conditions under which his/her work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- F. Recheck measurements and dimensions, before starting each installation.
 - 1. Submit to the Architect for review any change in dimensions shown on the Contract Documents or submittals affecting physical size, shape or location of any part of the work, whether due to field conditions or other causes.
- G. Passage of equipment:
 - 1. Establish passage clearances required to deliver, install and erect mechanical and electrical equipment. Wherever necessary, provide equipment in sections or knocked down in order to allow passage of equipment through available openings.
 - 2. Where there is not sufficient clearance for passage of mechanical or electric equipment, deliver, install and protect such equipment before confining walls, floors, slabs and steel work are erected. Schedule and coordinate this work with the work of other trades.

3. If any structure, equipment or system must be altered to allow passage of equipment, the person or entity responsible for providing that structure, equipment, or system shall restore it to its original condition, without additional cost to the Owner.
 4. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- H. Verify the size of shafts and chases, the adequacy of partition thickness and the clearance in double partitions and hung ceilings for proper installation of work.
1. Contractors shall cooperate in arranging their work with other Contractors whose work is in the same spaces.
 2. The amount of space occupied by each trade's work shall be kept to the minimum required.
 3. Arrange for chases, slots and openings in other building components during progress of construction, to allow for timely installation of work.
- I. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- J. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- K. Provide all appropriate structural supports, hangers, floor and wall and associated assemblies which include but are not limited to materials, finishes, equipment, fixtures, piping, raceways, mechanical and electrical components. This work shall be in conformance with requirements of the Contract Documents whether or not indicated by a reference in specification or as may be in detail shown on drawings and schedules.
- L. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- M. Install each component during weather conditions and construction status that will ensure best possible results. Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.
- N. Coordinate temporary enclosures with required inspections and tests, to minimize necessity of uncovering completed construction for that purpose.

O. Where mounting heights are not indicated:

1. Install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.
2. Install mechanical and electrical systems, materials and equipment to provide maximum possible headroom. Maintain maximum headroom and space conditions. Where headroom or space conditions (less than 8'-0") appear inadequate, the Architect shall be notified before proceeding with the work.

END OF SECTION 01040

SECTION 01050 - ALTERATIONS, CUTTING, PATCHING AND REFINISHING WORK

PART 1 - PRODUCTS

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 DESCRIPTION

- A. Work included: Alterations, removals and demolition required for this work include, but are not necessarily limited to:
 - 1. Alterations, cutting, patching, removal and preparation work to be done as noted on drawings and as required to complete construction.
 - 2. Patching and refinishing of existing surfaces damaged or left unfinished as a result of this work, including site work and existing ground surfaces; concrete surfaces, bituminous paving surfaces, etc.
 - 3. Protection.
 - 4. Asbestos.
 - a. The Contractor(s) shall review and familiarize themselves with the Owners Asbestos Hazard Emergency Response Act (AHERA) report prior to the commencement of any demolition activity. Also, the Contractor(s) will be provided with an inventory of all ACM (Asbestos Containing Materials) in the buildings where they are working, and will be required to sign a form (provided by the Owner) that they are in receipt of the inventory.
 - b. Contractor(s) are herein cautioned that asbestos may be within concealed spaces where work will be taking place. The Contractor shall immediately notify the Owner if any concerns or conditions arise in regards to potential asbestos containing building materials (ACBM's) in order that the owner may verify same and take appropriate action. The Contractor shall not proceed with the work until the material has been abated and air sampling clearance levels have been achieved as set forth by the Owner's Environmental Consultant.
 - c. The Contractor shall employ personnel who are trained in accordance with OSHA workplace standards as they pertain to asbestos.
 - d. **The Architect / Engineer has no authority or professional involvement relative to the hazardous material/asbestos removal or disposal phase**

for this project and are not available for questions and/or direction in this regard. The hazardous material/ asbestos reference is included as a convenience for the Owner, and the Architect accepts no responsibility nor liability for the accuracy of information, bidders conclusions, methods to be used, nor for any aspect of approvals required by the Contractor in undertaking and completing this project insofar as hazardous material/asbestos is concerned. The Contractor shall direct any/all questions and concerns to the Owners Hazardous Material Abatement Consultant.

- e. Worker and Community Right to Know Act Requirements
 - 1) It is required that the Contractor and/or Subcontractors comply with all of the requirements of HAZCOM 2012 and New Jersey Right To Know (RTK) program. General Contractor is responsible for ensuring that containers of substances belonging to the Contractor and/or Subcontractors that are stored at the Owner's facility are properly RTK labeled. Refer to N.J.A.C. 8:59-5.10.
 - 2) Surveys of hazardous substances stored at the Owner's facility by the Contractor and/or Subcontractor are to be provided to the Owner of the facility. Refer to N.J.A.C. 8:59-2.2(h).
 - 3) Material Safety Data Sheets (MSDS) and/or Safety Data Sheets (SDS) from manufacturers must be provided to the Owner for all products present at, purchased for, and brought on site by Contractors and/or Subcontractors to the Owner's facility. Refer to N.J.A.C. 8:59-2.2(1).
 - 4) Contractor and/or all Subcontractors must submit, prior to starting any work, a copy of their approved Hazard Communication Plan - 29 CFR 1910.1200.
- 5. This project shall be subject to the requirements of the EPA "Renovation, Repair and Painting" rule including the following:
 - a. The Contractor must be lead safe trained and certified. The Contractor will be required to submit a copy of their EPA certificate prior to the start of the work.
 - b. The Contractor shall provide the Owner with a copy of the EPA's Lead Hazard Management information pamphlet "Renovate Right-Important Lead hazard Information for Families, Child Care Providers and Schools" prior to the start of any renovation work. The Contractor shall have the Owner sign a pre-renovation disclosure form confirming receipt of the pamphlet.
 - c. The Contractor shall at all times employ lead safe practices as identified in the rules.

6. This project shall be subject to the requirements of the EPA rules on diesel exhaust and off-site particulate dust, including the following:
 - a. Diesel exhaust contributes the highest cancer risk of all air toxics in New Jersey and is a major source of NOx within the state. Therefore, per NJ DEP recommendations, construction projects involving non-road diesel construction equipment operating in a small geographic area over an extended period of time shall implement the following measures to minimize the impact of diesel exhaust:
 - 1) All on-road vehicles and non-road construction equipment operating at, or visiting, the construction site shall comply with the three minute idling limit, pursuant to N.J.A.C. 7:27-14 and N.J.A.C. 7:27-15. Contractor shall purchase "No Idling" signs to post at the site to remind subcontractors to comply with the idling limits. Signs are available for purchase from the Bureau of Mobile Sources at 609/292-7953 or <http://www.stopthesoot.org/sts-no-idle-sign.htm>.
 - 2) All non-road diesel construction equipment greater than 100 horsepower used on the project for more than ten days shall have engines that meet the USEPA Tier 4 non-road emission standards, or the best available emission control technology that is technologically feasible for that application and is verified by the USEPA or the CARB as a diesel emission control strategy for reducing particulate matter and/or NOx emissions.
 - 3) All on-road diesel vehicles used to haul materials or traveling to and from the construction site shall use designated truck routes that are designed to minimize impacts on residential areas and sensitive receptors such as hospitals, schools, daycare facilities, senior citizen housing, and convalescent facilities.
 - b. Contractor will be liable for the effects of off-site particulate dust and/or odors during construction and shall take steps to minimize the impact of air pollution from these activities.

B. Related Sections:

1. Section 00870 - Miscellaneous Requirements.
2. Section 01010 - Summary of the Work.
3. Section 01040 - Coordination.
4. Section 02070 - Selective Demolition.
5. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

- a. Requirements in this Section apply to mechanical and electrical installations. Refer to Mechanical and Electrical Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Location and Extent of Work: Submit key plan indicating room location where work to take place. Describe cutting and patching, indicate methods and show how they will be performed.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work. Provide samples and field mock-up as indicated or requested by the Architect.
 - a. Samples and field mock-up shall match existing surfaces and colors.
 - b. Obtain Architect's approval prior to proceeding with work.
 - 4. Schedule and Dates: Provide work schedule, indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. 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.

Coordinate cutting of operating elements with other plumbing, HVAC, electrical or other trades.

- C. Miscellaneous Building Elements: Do not cut and patch any building elements or related components in a manner that could change their operation, 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.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces 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.
 - 1. Engage experienced installers or fabricators for all work.
- E. 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.
- F. Mock-Ups: Provide mock-ups for Architect approval for each proposed patching method. Do not proceed with patching work until obtaining of approvals from the Architect.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties. Confirm existing warranties with Owner prior to starting of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

- B. Inspection:
 - 1. Prior to start of any work the General Construction Work Contractor shall verify all existing work area conditions; building lines, lengths, corners and all other dimensions.
 - a. General Construction Work Contractor shall engage a Licensed Professional Land Surveyor (PLS) to perform layout of the building and site elements. In addition, for building additions, the PLS shall verify all existing wall dimensions, angles, center lines, alignment points and other information which affect building closure. He shall also confirm floor to floor heights where applicable as well as any other vertical dimensions required for the execution of the work. Copies of all surveys performed by the General Contractor shall be submitted to the Architect in two copies and shall include layout drawings and data sheets.
 - b. All survey work must be done immediately in order to facilitate preparation of steel shop drawings by Steel Work Subcontractor.
 - 2. The General Construction Work Contractor shall submit information and survey to other Prime Work (Sub)Contractor(s), the Architect for all required coordination of new construction and all other related site work.
 - 3. The Structural Steel Work Subcontractor shall verify and confirm elevations and building dimensions with the General Construction Work Contractor prior to start of preparation of shop drawings for steel work.
 - 4. Prior to work of this section, verify information and survey submitted by the General Construction Work Contractor, carefully inspect the existing conditions and verify that materials and surfaces to be altered or removed are the same as noted on the drawings.

C. Discrepancies:

1. In the event of discrepancy of existing conditions, surfaces, etc., immediately notify the Architect.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing 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.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. The Contractor shall provide cutting, patching, relocations, and or re-installations of existing construction to provide for installation of other components or performance of other construction associated with his/her work, and subsequently patch and finish as required to restore surfaces to their original condition. Work shall be performed whether or not shown on drawings.
 2. The General Construction Work Contractor shall provide all required and necessary pockets in concrete and masonry walls and in new roof assemblies including all required cutting, and preparation work to allow for installation of new structural steel framing, supports, lintels, bearing plates, dunnage, etc. The General Construction Work Contractor shall subsequently patch as required to restore and prepare surfaces to receive new finishes.
 - a. Cutting roof decking, roof flashing, patching and associated roofing work in existing building(s), where no roofing replacement is indicated or required, shall be performed by each Prime Contractor for work included under the work of his/her contract.

3. All repairing, patching, piecing out, filling in, restoring and refinishing shall be neatly done by craftsmen skilled in their respective trades and completed in proper manner to leave same in condition satisfactory to the Architect.
4. All new work shall be installed plumb, level, true, and shall be shimmed as required to cover any irregularities in substrates.

B. Cutting:

1. Before cutting is started in any location the Contractor shall carefully investigate conditions as to human and structural safety, existing piping, wiring and items concealed, and wherever same interfere with the work they shall be properly relocated, rerouted or removed as the case may be, at no increase to contract price.
2. Cut existing 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.
3. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
4. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
5. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
6. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
7. Do not disturb any structural work, plumbing, steam, gas, or electric work without approval of Architect.
8. Mechanical and Electrical Services:
 - a. Cut off pipe or conduit in walls or partitions to be removed shall be performed by respective trade.
 - b. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting shall be performed by respective trade.

9. Proceed with patching after construction operations requiring cutting are complete.
 - a. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work.
 10. Existing work disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled or replaced with new work, and refinished and left in as good condition as existing before commencing work.
- C. 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 possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Field Mock-up: Prepare field mock-up of proposed restoration method as requested or required by the Architect. Obtain Architect's approval prior proceeding with actual work.
 3. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate or minimize evidence of patching and refinishing.
 4. Floors and Walls: Where walls, partitions and/or built-in cabinets that are removed extend one finished area into another, patch and repair floor and wall surfaces in the existing and new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing 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, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 5. Ceilings: Cut, remove, patch, repair, install new including hanging assemblies and finish ceilings as necessary to provide an even-plane surface of uniform appearance.
 6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

3.4 CLEAN-UP

- A. Areas where demolition is in progress within or adjacent to Owner occupied areas shall be broom cleaned at the end of each working day.
- B. Do not burn materials or debris on premises.
- C. Do not allow demolished materials to accumulate inside or outside of existing building.
- D. Remove from the site all rubbish and debris resulting from work of this section.
- E. If the Contractor fails to clean-up their debris within 24 hours, the Owner has the right to clean-up the debris left by the Contractor. All associated clean-up costs, incurred by the Owner, will be back-charged to the Contractor.

3.5 PROTECTION

- A. Contractor shall provide all other necessary temporary enclosures, guardrails, barricades, etc. to adequately protect all workers and public from possible injury. Provide all necessary temporary partitions, enclosures, coverings of approved materials and construction for the exclusion of weather and for confining dust and debris.
- B. Contractor shall be responsible for the protection of the existing building, facilities and improvements within the areas where work is being done. Any disturbance or damage to the work, the existing building, and improvements, equipment or any impairments of facilities resulting from his/her work, shall be promptly restored, repaired, or replaced by the responsible Contractor at no extra cost to the Owner.
- C. Adequate protection of persons and property shall be provided at all times, including Saturdays, Sundays and holidays, and during time work is being performed and after working hours. Protection shall include barricade fencing, traffic control, dust partitions, weather protection and other means as required.
- D. Preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site and along access to the site. Be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment, stock-piling of materials or tracking of grass areas by equipment.

3.6 SALVAGE

- A. Partial Removal: Items of salvable value to Contractor may be removed from structure as work progresses. Salvage items must be transported from site as they are removed.
 - 1. Storage or sale of removed items on site will not be permitted.

- B. Items designated on drawings or in specifications to remain the property of the Owner, or to be reused, shall be removed, and securely stored with care to prevent damage. Repair or replace such items damaged in removal.
- C. Before transporting non-designated, removed items from the site, contact Architect for decision as to what items if any are to remain the property of the Owner. Items retained by the Owner will be transported by him/her to his/her storage area.

3.7 STANDARDS

- A. All demolition work shall be performed in accordance with the applicable rules and regulations and the Codes and Ordinances of local, State and Federal authorities, and in accordance with the requirements of public utility corporations.
- B. Work shall satisfy requirements of the Occupational Safety and Health Act of 1970 with amendments.
- C. Work not affected by more stringent requirements of regulatory agencies shall satisfy the provisions of ANSI-A10.6-2006 - American National Standard Safety Requirements for Demolition.
- D. Confine the movement and storage of vehicles, equipment and materials to such routes and locations as may be designated by the Owner and Architect.
- E. The building and grounds will be maintained in a clean and orderly manner so as to conform with all local fire safety regulations and in accordance with the latest editions of the Safety Code of the National and State Board of Fire Underwriters.

3.8 INGRESS, EGRESS AND CIRCULATION

- A. The Prime Contractor shall be responsible for performing his/her construction activities in such manner to maintain ingress and egress for visitors and occupants of Owner-occupied areas and to continuously maintain all required emergency exits from and circulation between existing facilities. Passageways for emergency exits shall be kept continuously free from debris, construction equipment, tools, stockpiles or materials, and other hazards to speedy evacuation. The Contractor shall provide all necessary temporary work as prudence and good practice may dictate and in accordance with Applicable Law and Authorities having jurisdiction to obtain and maintain all such ingress, egress and circulation requirements. The Prime Contractor shall be responsible for providing coordination of this temporary work between Subcontractor(s), as directed by the Architect. All temporary work shall be removed when no longer required.

3.9 NON-INTERFERENCE WITH OWNER'S OPERATIONS

- A. Work under this Contract will be performed when the existing buildings are occupied. Coordinate with Owner's schedule and operation, obtain Owner's approval prior to

proceeding with work.

- B. Contractor shall acquaint himself with the general character of the Owner's operations prior to commencing work and shall schedule his/her work to avoid interference therewith. The sequence of alteration operations shall be in accordance with a schedule of contract operations approved by the Owner and Architect.
- C. The Contractor shall not start work until the schedule has been approved in writing by the Architect and the Owner. The Contractor shall not perform work in occupied areas without giving the Owner 72 hours written notice of his/her intention to work in occupied areas.
- D. The Contractor shall expedite placing orders and submission of shop drawings for equipment required to complete work under this Contract to ensure delivery of all equipment with adequate time allowed to complete the installations to conform to the project completion date.

END OF SECTION 01050

SECTION 01151 - UNIT PRICES

PART 1 GENERAL

1.1 PROCEDURE

- A. Bidder shall insert on the Proposal Form, all Unit Prices applicable to the work under his/her bid. Unit Prices will be used as the basis for computing "additions to" or "deductions from" the Contract Price for extra work and for work countermanded, reduced or omitted.
- B. Except as otherwise provided in the General Conditions, the Unit Prices when accepted, adjusted or established by the Contract shall remain binding and irrevocable for the entire period of the Contract, regardless of the quantities of work ordered or required under such Unit Prices.
- C. The acceptance of the Unit Price is on condition that the general character of the material and workmanship required for any work related thereto shall be equivalent to corresponding work as shown and specified, and that all costs, overhead and profit, as well as all incidental work required in connection therewith, has been included in the Unit Price.

1.2 RULES OF MEASUREMENT: EARTHWORK

- A. Except as provision is made hereinafter for arbitrary measurement, the quantity of excavation shall be its in-place volume before removal.
- B. The reference point for computing changes in depth shall be the plan grade at which the change starts.
- C. No allowance will be made for excavating additional material of any nature taken out for the convenience of the Contractor beyond the quantity computed under these Rules of Measurement.
- D. Excavations shall be in accordance with OSHA requirements and that excavations should be shored and braced, as needed, to avoid encroaching into existing site improvements that are noted to remain undisturbed.
- E. Excavation for a footing (the pad) under a wall shall be measured as the neat plan width and depth of the footing
- F. Rock excavation shall arbitrarily be assumed to extend to vertical planes one foot beyond wall lines, pipe, etc., and to 6 inches below the established elevations.
- G. Excavation for footings for columns or piers shall be computed as vertical shafts, each with a horizontal cross section identical in shape and size with the bottom of the footing.

- H. The volume of backfill shall be the volume of excavation computed under these Rules of Measurement, less the volume of actual displacement by walls, beams, columns, piers, footings or other construction installed.
- I. Concrete quantities shall be computed from plan size, or if there are no drawings, from actual measurement of the work ordered and placed.

1.3 UNIT PRICES - GENERAL CONSTRUCTION, PLUMBING AND DRAINAGE, HEATING, VENTILATING AND AIR CONDITIONING, AND ELECTRICAL: EARTHWORK

- A. Bulk Rock and Trench or Pit Rock Excavation requiring jackhammering - Per Cubic Yard. Price shall include the breaking up of the rock by other means as directed by the Architect and its removal from the site, specified for other excavated material, and shall be the price over and above the price for earth excavation.

The Unit Price for bulk rock shall be \$ 300.00 per cubic yard
 and trench or pit rock excavation shall be \$ 400.00 per cubic yard

If the Contractor cannot perform the work at the given unit price, he/she shall accept for consideration subcontractor's price suggested by the Owner and/or the Architect.

1.4 UNIT PRICES - GENERAL CONSTRUCTION: Materials in Place.

Excavation (unsuitable soil) \$ _____ per cu. yd.
 Compacted fill \$ _____ per cu. yd.
 Concrete Curb \$ _____ per lin. ft.

1.5 UNIT PRICES - ELECTRICAL WORK: Materials in Place.

Power outlet (duplex or quadraplex), including outlet boxes and wiring. Receptacles will generally be connected within 10' of adjacent receptacle circuits \$ _____ per unit

END OF SECTION 01151

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
 - 1. Pre-Construction Conference
 - 2. Pre-Installation Conferences
 - 3. Coordination Meetings
 - 4. Progress Meetings
- B. Construction Schedule requirements is specified in another Division 1, Section.

1.3 PRE-CONSTRUCTION CONFERENCE

- A. The Architect will schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than fifteen (15) calendar days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect, and their consultants, the Prime Contractor and his/her superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.
- C. Agenda: Discuss items of significance that could effect progress including such topics as:
 - 1. Tentative construction schedule
 - 2. Critical work sequencing
 - 3. Designation of responsible personnel
 - 4. Procedures for processing field decisions and Change Orders
 - 5. Procedures for processing Applications for Payment
 - 6. Distribution of Contract Documents
 - 7. Submittal of Shop Drawings, Product Data, and Samples
 - 8. Preparation of record documents
 - 9. Use of the premises
 - 10. Office, Work, and storage areas

11. Equipment deliveries and priorities
12. Safety Procedures
13. First Aid
14. Security
15. Housekeeping
16. Working hours

1.4 PRE-INSTALLATION CONFERENCES

- A. The Prime Contractor to conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The installer and representative 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 the Architect of scheduled meeting dates.
 1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
 - a. Contract Documents
 - b. Options
 - c. Related change orders
 - d. Purchases
 - e. Deliveries
 - f. Shop Drawings, product data and quality control samples
 - g. Possible conflicts
 - h. Compatibility problems
 - i. Time schedules
 - j. Weather limitations
 - k. Manufacturer's recommendations
 - l. Compatibility of materials
 - m. Acceptability of substrates
 - n. Temporary facilities
 - o. Space and access limitations
 - p. Governing regulations
 - q. Safety
 - r. Inspection and testing requirements
 - s. Required performance results
 - t. Recording requirements
 - u. Protection
 2. Record significant discussions and agreements and disagreements of each conference along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner, and the Architect.

3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.5 COORDINATION MEETINGS

- A. The Contractor for General Construction will conduct project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
- C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.6 PROGRESS MEETINGS

- A. Regular Progress Meetings: The Architect will schedule and conduct regular progress meetings as follows:
 1. Bi-weekly meeting with the Owner, Architect, Contractor and Subcontractors.
 - a. Weekly meetings between the Contractor and Subcontractors will be the responsibility of the Contractor and the Architect will not attend.
- B. Special Meetings will be conducted as required by the progress of the work
- C. Location of the meetings: Meetings shall be conducted at a location in the school(s) to be determined by the Owner's Representative.
- D. Attendance: Attendance at Construction Meetings shall be as follows:
 1. The Owner shall be in attendance at bi-weekly meetings and at any special meetings as appropriate to the agenda.
 2. The Architect and their professional consultants, as needed, at bi-weekly meetings and at any special meetings as appropriate to the agenda.
 3. The Contractor at all construction meetings.
 4. Subcontractors as appropriate to the agenda.
 5. Suppliers as appropriate to the agenda.
 6. The Owner's Representative at all construction meetings.

- E. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the project.
- F. Contractor's Construction Schedule:
 - 1. Review the present and future needs of each entity present, including such items as:
 - a. Interface requirements
 - b. Time
 - c. Sequences
 - d. Deliveries
 - e. Off-site fabrication problems
 - f. Access
 - g. Site utilization
 - h. Temporary facilities and services
 - i. Hours of work
 - j. Hazards and risks
 - k. Housekeeping
 - l. Quality and work standards
 - m. Change orders
 - n. Documentation of information for payment requests
- G. Reporting: No later than three (3) business days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- H. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
- I. Attendance by the Contractor(s) is mandatory, whether the meetings are weekly, bi-weekly or at whatever interval is determined by the Architect.
 - 1. Unless given prior approval by the Architect in writing not to attend meetings, Contractor will be fined **\$250.00** for each regularly scheduled meeting for which he/she is not represented by a person in authority who can speak for and/or make decisions for the Contractor.
 - 2. Fine amounts shall be withheld and deducted from the Contract Sum.

END OF SECTION 01200

SECTION 01400 - MATERIAL TESTING / QUALITY CONTROL SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for material testing and quality control services.
 - 1. **If Alternate Bid 1 is awarded, the International Construction Code (ICC) requires Special Inspections - Material Testing shall be engaged and performed through Owner's Testing Inspection Agency which will be paid for by the Owner by means of an Allowance which is indicated in Section 01020.**
 - 2. **Testing and inspecting services other than the Special Inspections - Material Testing are required to verify compliance with requirements specified or indicated and are the responsibility of the Contractor. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.**
- B. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 1. Quality Control Services is the responsibility of the Contractor.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Architect, and the Owner or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections in AIA Document A201 and Section 01200.

2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
3. Specification Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality Control Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.
 1. Mockups establish the standard by which the Work will be judged.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 DELEGATED DESIGN

- 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 REGULATORY REQUIREMENTS

- A. Copies of Regulations: Obtain copies of referenced regulations which also available in Local Public Libraries.

1.6 SUBMITTALS

- A. Qualification Data: 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.

- B. Delegated-Design Submittal: When requirement is indicated in specific technical section and/or when requested by the Architect, 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.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
 2. Description of test and inspection.
 3. Identification of applicable standards.
 4. Identification of test and inspection methods.
 5. Number of tests and inspections required.
 6. Time schedule or time span for tests and inspections.
 7. Entity responsible for performing tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number 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. Ambient conditions at time of sample taking and testing and inspecting.
 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.
- E. Permits, Licenses, and Certificates: For Owner's records, 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.

1.7 QUALITY ASSURANCE

- A. 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.
- B. 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.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, 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.
- D. 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.
- 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 to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications 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. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
 - 1. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
 - 2. Contractor responsibilities include the following:
 - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies

to adequately demonstrate capability of product to comply with performance requirements.

- b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
 - d. When testing is complete, remove assemblies; do not reuse materials on Project.
3. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and the Owner 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.
- H. Mockups: 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 of size indicated or, if not indicated, as directed by Architect .
 2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 6. Demolish and remove mockups when directed, unless otherwise indicated.

1.8 QUALITY CONTROL

- A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - a. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- B. Owner Responsibilities: Owner will engage a qualified testing agency to perform the Special Inspections - Material Testing services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting 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, and **the Contract Sum will be adjusted by Change Order Credit to the Owner.**
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - a. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. 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.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

1. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - a. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - b. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - c. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - d. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 - e. Do not perform any duties of Contractor.
2. Associated Services: Cooperate with agencies 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:
 - a. Access to the Work.
 - b. Incidental labor and facilities necessary to facilitate tests and inspections.
 - c. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - d. Facilities for storage and field-curing of test samples.
 - e. Delivery of samples to testing agencies.
 - f. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - g. Security and protection for samples and for testing and inspecting equipment at Project site.
3. 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 inspecting.

- a. Schedule times for tests, inspections, obtaining samples, and similar activities.
4. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.
 - a. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

- A. For **Class I Buildings** (only), Testing Agencies / Special Inspector shall be established and recognized agency or design professional acting as the approved agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved. Special inspectors shall be certified in accordance with administrative provisions of the Uniform Construction Code (NJ UCC), N.J.A.C. 5:23-1.1 (2013), N.J.A.C. 5:23-3.14, N.J.A.C. 5:23-2.20(b), NJ DCA Bulletin No. 03-5 (Rev. November 2008) and applicable requirements of International Building Code (ICC), Chapter 17 as indicated below:
 1. Steel Construction (ICC, Section 1705.2 and Table 1705.2.3),
 2. Concrete (ICC, Section 1705.3 and Table 1705.3),
 3. Soils (ICC Section 1705.6 and Table 1705.6).
- B. Statement of Special Inspections: Where special inspection(s) or testing is required as indicated in ICC, Section 17, the registered design professional shall prepare a statement of special inspections in accordance with ICC, Section 1704.3 for submittal by the applicant.
- C. Records of each inspection must be submitted to the building official so as to compile legal record of the project. These records must include all inspections made, violations and discrepancies.
 1. Before a certificate of occupancy is issued, a final report must be submitted indicating that all special inspections have been made and all discrepancies have been resolved or removed in order to show compliance with the applicable code requirements.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
 - 2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
 - 3. Protect construction exposed by or for quality-control service activities.
 - 4. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01410 - REFERENCES AND INDUSTRY STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved:" The term "approved," when used to convey Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities.
- C. "Directed:" Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.
- D. "Indicated:" The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- E. "Regulations:" The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish:" The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install:" The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide:" The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer:" An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

- J. The term "experienced," when used with an entity, means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction, subject to verification by and approval of the Architect.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. "Project site(s)" is the 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. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
 - 1. 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.
- D. Copies of Standards: Each entity engaged in construction on Project must 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 and make them available on request.

- E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S." .

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01410

SECTION 01455 - CONCRETE IN-SITU RELATIVE HUMIDITY AND pH TESTING

PART 1 - GENERAL REQUIREMENTS

1.1 SUMMARY

- A. The General Construction Work Contractor shall engage and pay for a testing agency to provide in-situ concrete relative humidity and surface pH testing to existing concrete surfaces specified to be covered with floor coverings or resinous coatings. Testing Agency shall be approved by the Architect / Owner.
- B. Testing to be scheduled no less than 1 nor more than 3 weeks prior to scheduled flooring installation.

1.2 RELATED SECTIONS:

- A. Section 09650 - Resilient Flooring
- B. Section 09682 - Carpet Entry Mats (CEM)

1.3 REFERENCES

- A. ASTM F-2170-11- Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes
- B. ASTM F-710-11 - Standard Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
- C. ASTM F-1869-11 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.4 SUBMITTALS

- A. Report all test results in chart form listing test dates, time, depth of test well, in-situ temperature, relative humidity and pH levels.
- B. List test locations on floor plans and show same on 8-1/2 x 11 Table and Location maps. Deliver results in duplicate for distribution to Architect and General Contractor.

1.5 QUALITY ASSURANCE

- A. Independent Testing Agency
 - 1. Certified by Test Apparatus Manufacturer for product use.

2. I.C.R.I. (International Concrete Repair Institute) certified, or other agency with verifiable experience.
- B. Flooring Installers
1. Certified and /or approved by Test Apparatus Manufacturer for product use.
- C. Digital “Reader” and calibrated relative humidity sensors.
1. Factory-calibrated “Smart Sensors” using Touch-n-Sense™ technology.
 2. NIST-traceable factory calibration
- D. Wide range pH paper, and distilled or de-ionized water.

PART 2 - PRODUCTS

2.1 MANUFACTURES

- A. Rapid RH® relative humidity and temperature sensor kit as manufactured by Wagner Meters, Rogue River, OR, Tel.# 800.634-9961, www.wagnermeters.com; or approved equal.
- B. pH test paper as manufactured by Micro Essential Laboratory; or approved equal.

PART 3 - EXECUTION

3.1 QUANTIFICATION OF RELATIVE HUMIDITY AT 40% OF CONCRETE THICKNESS

- A. The test site should be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperature and humidity levels should be maintained for 48 hours prior and during test period. If meeting this criteria is not possible, then minimum conditions should be 75± 10°F and 50± 10% relative humidity. When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.
- B. The number of in-situ relative humidity test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 in the first 1,000 sq. ft. and 1 per each additional 1,000 square feet.
- C. Determine the thickness of the existing concrete slab, typically from construction documents.

- D. Utilizing a roto-hammer drill test holes to a depth equal to 40% of the concrete thickness*. (i.e.: 2" deep for a 5" thick slab, or 1½" deep for a 4" thick slab). Hole diameter shall not exceed outside diameter of the probe by more than 0.04". Drilling operation must be dry.
- E. Vacuum and brush all concrete dust from test hole.
- F. Insert a relative humidity probe (sensor) to the full depth of test hole. Place cap over probe.
- G. Permit the test site to acclimate, or equilibrate, for 1 to 2 hours prior to taking relative humidity readings.
- H. Remove the cap, insert the cylindrical reading device, and press button on the device to obtain reading from the in-situ probe.
- I. Read and record temperature and relative humidity at the test site.

* Elevated structural slab (not poured in pans) should be tested at a depth equal to 20% of its thickness.

3.2 QUANTIFYING pH LEVEL

- A. At or near the relative humidity test site perform pH test.
 - 1. Place several drops of water onto the concrete surface to form a puddle approximately 1" in diameter.
 - 2. Allow the water to set for approximately 60 seconds.
 - 3. Dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine pH reading
- B. Record and report results to the Architect and the General Contractor.

END OF SECTION 01455

SECTION 01505 - TEMPORARY FACILITIES

1.1 RESPONSIBILITIES OF CONTRACTOR

A. Contractor is responsible for the following temporary facilities and services:

1. Installation, operation, maintenance and removal of each temporary facility usually considered as its own normal construction activity.
2. Plug in electric cords, extensions cords, supplementary plug in task lighting and special lighting necessary exclusively for his/her own activities.
3. His/Her own storage and fabrication sheds.
4. All hoisting requirements for his/her work.
5. Collection and disposal of debris, hazardous, unsanitary or other harmful waste material from their operations, on a daily basis to trash receptacles, hoppers, containers, dumpsters, etc. furnished by the Contractor.
 - a. **Refer to Section 01050 - Alterations, Cutting, Patching and Refinishing Work which identifies the responsible Contractor for the collection and disposal of debris and Section 01524 - Construction Waste Management for additional information.**
6. Six foot (6'-0") high site enclosure fence, including maintenance and any gates needed. Provide fence relocations as needed during construction.
7. The secure lockup of his/her own tools, materials and equipment.
8. Construction aids and miscellaneous services and facilities necessary exclusively for his/her own construction activities.
9. Temporary storage provisions for work, including offsite provisions, if required.
10. Containerized bottled drinking water units for his/her personnel.
11. Fire protection provisions related to work including fire extinguishers.
12. All personnel safety equipment and provisions for his/her personnel.
13. Environmental protections.
14. Dust and fume control
15. Tree and plant protection.

16. Other temporary facilities and services stated as their responsibility elsewhere in the Project Documents.
17. Temporary toilets in sufficient quantity to suit project needs and including disposable supplies.

1.2 COMPRESSED AIR

- A. Contractor shall furnish his own equipment and energy source to provide compressed air required for the completion of work under his/her contract.

1.3 REMOVAL AND RESTORATION OF TEMPORARY FACILITIES

- A. At the completion of the work prior to final payment, Contractor shall remove temporary facilities and work which he/she has been responsible. Refer to Section 01700 for additional requirements.

1.4 UTILITY CONSUMPTION

- A. The Owner shall be responsible and pay all utility costs for electric and water consumption during the construction period.

END OF SECTION 01505

SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

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 administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. All of Division 1 and attached specifications and drawings that make a part of this contract.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 SUBMITTALS

- A. Waste Management Plan: Submit 4 copies of plan within 30 days of date established for the Notice to Proceed.

- B. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- C. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- D. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Qualification Data: For refrigerant recovery technician.
- G. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 1. Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, and waste reduction work plan. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 2. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 4. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Owner / Architect. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with Division 1 Section "Temporary Facilities" for operation, termination, and removal requirements.

- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Sale and Donation: Not permitted on Project site.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area.
 - 4. Store components off the ground and protect from the weather.

5. Remove recyclable waste off Owner's property and transport to recycling receiving or processor.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials on site.

C. Burying: Do not bury waste materials on site.

D. Disposal: Transport waste materials off Owner's property and legally dispose of them.

E. Washing waste materials into sewers or drains is not permitted.

END OF SECTION 01524

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications sections included in Part-2 through Part-6.

1.2 SUMMARY

- A. Section Includes:
 - 1. General product requirements, including:
 - a. General specification requirements for all products.
 - b. General requirements and procedures for maintenance materials and tools.
 - 2. General requirements for product documentation, including:
 - a. Requirements and procedures for schedule of products.
 - b. General requirements for operation and maintenance data.
 - 3. General procedures for products including:
 - a. Procedures for transportation and handling.
 - b. Procedures for delivery and receiving.
 - c. Procedures for storage.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Components required to be supplied in quantity within a specification section shall be identical, interchangeable, and made by the same manufacturer.
- B. Do not use products removed from existing construction.

2.2 MAINTENANCE MATERIALS AND TOOLS

- A. Maintenance Materials: Parts and materials for repair and maintenance; specific items required are specified in product sections.
 - 1. Provide products and tools which are identical to those used in the work; if necessary to obtain identical items, order at the same time as products to be installed or tools to be used in the work.
- B. Package appropriately and label to show type and quantity of contents.

- C. Deliver, handle, and store in the same manner as products to be installed.
- D. Do not turn over to the Owner until date of substantial completion, unless otherwise approved by the Owner.
- E. Deliver to the Owner; unload.
- F. Obtain receipt prior to final payment.

PART 3 - EXECUTION

3.1 PRODUCTS

- A. It is the Contractor's responsibility to select products which comply with the contract documents and which are compatible with one another, with existing work, and with products selected by other Contractors.
 - 1. Verify that electrical characteristics of products are compatible with electrical systems; notify architect of all discrepancies.
 - 2. Where visual matching to an established physical sample is required, the Architect's decision will be final.
- B. Do not use any substitute products which have not been approved in accordance with the requirements of the contract documents.
- C. Where the specification is silent on whether substitutions will be considered, substitutions will be considered only when submitted in accordance with AIA A201 and Section 00800.
- D. Products Specified by Reference Standard: Use any product meeting the specification. Provisions of reference standards shall not modify the responsibilities of the Owner or Architect as defined in the contract documents.
- E. Products Specified by Performance Requirements: Use any product meeting the specification.
- F. Products Specified to Match a Physical Sample: Use any product that matches; obtain the Architect's approval.
- G. Products Specified by Listing a Brand Name Product(s) made by listed Manufacturer(s) as the "Basis of Design":
 - 1. Pursuant to N.J.S.A. 18A:18A-15(d) indicated basis of design brand name product(s) or equivalent made by one of the manufacturers listed will be acceptable, as determined by the Architect.

- H. Products Specified by Listing Brand Name Product(s) Accompanied by Language Indicating that Substitutions Are Allowed: Provide a product meeting the specification; submit substitution request for any brand-name product, that is not listed, in accordance with AIA A201 and Section 00800.
- I. Products Specified by Listing Manufacturer(s): Provide a product meeting the specification and made by one of the manufacturers listed or an approved equal. Approval of substitutions will be in accordance with AIA A201 and Section 00800.
- J. Unless specified or noted otherwise in the Contract Documents and/or approved submittals, all Work is to be performed in accordance with the respective material Manufacturer's printed installation instruction. Work installed in variance with the Contract Documents, Approved Submittals and Manufacturer's printed installation instructions will be rejected, removed and replaced by the Contractor and at no additional cost to the Owner.

3.2 SCHEDULE OF PRODUCTS

- A. Prepare a complete schedule of products used, including the following for each product:
 - 1. Manufacturer's name.
 - 2. Brand or trade name.
 - 3. Model number, if applicable.
 - 4. Reference standard, if more than one is applicable.
 - 5. Arrange products in the schedule by specification sections; indicate paragraph where specified.
- B. Prepare and submit a preliminary schedule within 15 working days after award of contract; resubmit when revised; submit final schedule prior to final payment. See additional requirements and milestone dates in Section 01800.
- C. Schedule of products shall not be used to obtain approval of substitute products; make separate request for substitution.

3.3 OPERATION AND MAINTENANCE DATA

- A. Provide operation and maintenance data as specified in individual product sections.
 - 1. Provide data sufficient for operation and maintenance by Owner without further assistance from the manufacturer.
 - 2. Provide completed data in time for use during Owner instruction.
- B. Data Required For Products - General:
 - 1. Name of manufacturer and product.

2. Name, address, and telephone number of subcontractor or supplier.
 3. Local source of replacements.
 4. Local source of replaceable parts and supplies.
- C. Product Data: Where product data is specified for inclusion in operation and maintenance data, provide manufacturer's data sheets marked to indicate specific product and product options actually installed; delete inapplicable data.
- D. Project Record Documents: Provide an additional copy of applicable record documents for inclusion with the operation and maintenance data.
- E. Coordination Drawings: When coordination drawings are prepared, include a copy with the operating and maintenance data.
- F. Custom Manufactured Products: Provide all information needed for reordering.
- G. Finish Materials: Manufacturer's product data, color/texture designations, and manufacturer's instructions for care, cleaning, and maintenance.
- H. Products Exposed to Weather and Products for Moisture Protection: Manufacturer's product data, recommended inspection schedule and procedures, maintenance and repair procedures, and maintenance materials required.
- I. Equipment: Provide at least the following information:
1. Product data giving equipment and function description, with normal operating characteristics and limiting conditions.
 2. Starting, operating, and troubleshooting procedures.
 3. Cleaning and maintenance requirements and procedures.
 4. External finish maintenance requirements.
 5. List of maintenance materials required.
 6. List of special tools required.
 7. Parts list: List all replaceable parts, with ordering data.
 8. Recommended quantity of spare parts to be maintained in storage.
- J. Systems: Provide overall function description, with diagrams, prepared especially for this project.
- K. Form of Data: Prepare data in the form of an instructional manual.
1. Arrange contents logically, using section numbers and sequence of sections indicated on the table of contents of this project manual.
 2. When multiple volumes are used, arrange by related subjects; identify contents in cover title.

3. Assemble into 3-ring binders with maximum 2-inch ring size.
 - a. Hardback, cleanable plastic covers.
 - b. Identify each book with title "Operation and Maintenance Instructions" and project name.
 - c. Page size 8-1/2 by 11 inches, maximum.
 - d. Prepare special typewritten data on minimum 20-pound paper.
 - e. Provide tabbed divider for each product and system.
 - f. Drawings: Bind in with other data; provide reinforced binding edge; fold larger drawings to size of pages.
 - 1) Do not use pockets or loose drawings.
4. Provide table of contents for each volume listing:
 - a. Name of the project.
 - b. Name, address, telephone number, and contact name of:
 - 1) Architect.
 - 2) Contractor.
 - c. Index of products and systems included in volume.

3.4 TRANSPORTATION AND HANDLING

- A. Require supplier to package finished products in a manner which will protect from damage during shipping, handling, and storage.
- B. Transport products by methods which avoid damage.
- C. Deliver in dry, undamaged condition in manufacturer's unopened packaging.
- D. Provide equipment and personnel adequate to handle products by methods which prevent damage.
- E. Provide additional protection during handling where necessary to prevent damage to products and packaging.
- F. Lift large and heavy components at designated lift points only.

3.5 DELIVERY AND RECEIVING

- A. Arrange deliveries of products to allow time for inspection prior to installation.
- B. Coordinate delivery to avoid conflict with the work and to take into account both the conditions at the site and the availability of personnel, handling equipment, and storage space.
- C. Clearly mark partial deliveries to identify contents, to permit easy accumulation of entire delivery, and to facilitate assembly.

- D. Promptly inspect shipments and remedy damage, incorrect quantity, incompleteness, improper or illegible labeling, and noncompliance with requirements of contract documents and approved submittals.

3.6 STORAGE

- A. No indoor storage areas are available on site.
- B. General Storage Procedures:
 - 1. Store products immediately on delivery.
 - 2. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
 - 3. Store in a manner to prevent damage to the stored products and to the work.
 - 4. Store moisture-sensitive products in weathertight enclosures.
 - 5. Store indoors if necessary to keep temperature and humidity within ranges required by manufacturer.
 - 6. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.
 - 7. Arrange storage to provide access for inspection and inventory.
 - 8. Periodically inspect and remedy damage and noncompliance with required conditions.
- C. Loose Granular Materials: Store on solid surfaces in well-drained area; prevent mixing with foreign materials.
- D. Exterior Storage:
 - 1. Cover products subject to weather damage with impervious sheet covering; provide ventilation to avoid condensation.
 - 2. Provide surface drainage to prevent runoff or ponded water from damaging stored products.
 - 3. Prevent damage and contamination from refuse and chemically injurious materials and liquids.
 - 4. Store fabricated products on substantial platforms, blocking, or skids above the ground, sloped to drain.

END OF SECTION 01600

SECTION 01700 - PROJECT CLOSEOUT DOCUMENTS AND PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Specifications, Division 1 - Miscellaneous Requirements Sections, and Specification Sections included in Part-2 through Part-6.

1.2 SUMMARY

- A. Section Includes:
 - 1. Maintenance of Project Record Documents,
 - 2. Record drawings, including As-Built drawings,
 - 3. Record project manual (specifications),
 - 4. Operation and Maintenance Manuals,
 - 5. Warranties,
 - 6. Extra Materials,
 - 7. Submittals required prior to requesting for determining dates of substantial and final completion, and also prior to release of final payment(s),
 - 8. Transmittal of Closeout Project Documents to the Owner,
 - 9. Instructions of Owner's personnel,
 - 10. Final Cleaning.
- B. GENERAL REQUIREMENTS
 - 1. All submittals shall indicate reference to the appropriate Architect's Project Number.
- C. As-Built Drawings:
 - 1. Full-size paper set.
 - 2. Two (2) CD-Roms.

1.3 MAINTENANCE OF PROJECT RECORD DOCUMENTS

- A. Do not use record documents of any type for construction purposes.
- B. Maintain record documents in a secure location at the site while providing for access by the Contractor and the Architect during normal working hours; store in a fire-resistive room or container outside of normal working hours.
- C. Record information as soon as possible after it is obtained.
- D. Assign a person or persons responsible for maintaining record documents.

E. Record the following types of information on all applicable record documents:

1. Dimensional changes.
2. New and revised details.
3. Actual routing of piping and conduit.
4. Revisions to electrical circuits.
5. Actual equipment locations.
6. Sizes and routing of ducts.
7. Locations of utilities concealed in construction.
8. Particulars on concealed products which will not be easy to identify later.
9. Changes made by modifications to the contract; note identification numbers if applicable.
10. New information which may be useful to the Owner, but which was not shown in either the contract documents or submittals.

1.4 RECORD AND AS-BUILT DRAWINGS

A. During the progress of the installation, the Contractor shall keep a careful record of all changes and variations in the arrangement of his/her work from the layout shown on the Contract Drawings in order that the Owner may be provided with a complete set of all plans (As-Builts) showing the work as actually installed.

1. The Contractor shall maintain complete two (2) sets of opaque prints of the contract drawings, marked to show changes which occur due to his/her work.
2. Where the actual work differs from that shown on the drawings, mark this set to show the actual work.
3. Mark location of concealed items before they are covered by other work.
4. Mark either record contract drawings or shop drawings, whichever are best suited to show the change.
5. Where changes are marked on record shop drawings, mark cross-reference on the applicable contract drawing.
6. When the Contractor is required by a provision of a modification to prepare a new drawing, rather than to revise existing drawings, obtain instructions from the Architect as to the drawing scale and information required.
7. Keep drawings in labeled, bound sets.
 - a. Mark with red pencil.
 - b. Mark work of separate contracts with different colors of pencils.
8. Incorporate new drawings into existing sets, as they are issued.

9. Where record drawings are also required as part of operation and maintenance data submittals, make copies from the original record drawing set.
 10. As-Built Drawing Format to be submitted to the Architect:
 - a. One (1) complete, legible full-size paper (hard copy) As-Built drawing set with the following information on each page:
 - 1) Note: "As-Built" drawing,
 - 2) Contractor's Firm name,
 - 3) Date.
 - b. Two (2) copies, pdf format CD-Rom, scanned As-Built drawings of the hard copy furnished to the Owner (indicated above) shall be furnished to the Owner and the Architect and as directed by the Architect.
 11. Mechanical/ Electrical As-Built drawings must be submitted to the Engineer with a copy of the transmittal to the Architect. Approval must be obtained before issuing Final Certificate of Payment.
- B. Record drawings shall be provided for **all work** including but not limited to the following:
1. General Construction Work
 2. Structural Steel Work
 3. HVACR Work
 4. Electrical Work

1.5 PROJECT SPECIFICATION MANUAL

- A. The Contractor shall maintain a complete copy of the project specification manual, marked to show changes which occur due to his/her work.
- B. Where the actual work differs from that shown in the project manual, mark the record copy to show the actual work.
 1. Include a copy of each addendum and modification to the contract.
 2. In addition to the types of information required on all record documents, record the following types of information:
 - a. Product options taken, when the specification allows more than one.
 - b. Product substitutions.
 - c. Proprietary name and model number of actual products furnished, for each product, material, and item of equipment specified.
 - d. Name of the supplier and installer, for each product for which neither a product data submittal nor a maintenance data submittal was specified.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
 - a. Emergency instructions and procedures.
 - b. System, subsystem, and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - d. Description of controls and sequence of operations.
 - e. Piping diagrams.
 2. Maintenance Data:
 - a. Manufacturer's information, including list of spare parts.
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.
 - h. Copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.
- C. Operation and Maintenance Manuals must be submitted to the appropriate Engineer with a copy of the transmittal to the Architect. Approval must be obtained before issuing Final Certificate of Payment.
1. Contractors shall submit electronic version of the MEP/FP O&M manuals for review by the MEP/FP Consultant. *Paper copies should not be submitted as part of the MEP/FP review process.

1.7 WARRANTIES

- A. Submittal Time: 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.

- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-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 manual must be submitted to the Architect for review. Architect's approval must be obtained before issuing final payment.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.8 SUBMITTAL REQUIREMENTS - SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and digital images on CD Rom, damage or settlement surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 8. Complete startup testing of systems.
 9. Submit test/adjust/balance records.
 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 11. Advise Owner of changeover in heat and other utilities.
 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 13. Complete final cleaning requirements, including touch-up painting.
 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. 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.

1.9 SUBMITTAL REQUIREMENTS - FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to the requirements of the Contract Documents.
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and signed by Contractor.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes. Provide statement signed by Owner's representatives stating that they have received required training.
- B. Inspection: Submit a written request for final inspection for acceptance. 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. The cost of additional inspections required by the Architect or his/her consultants due to Contractor's failure to complete the punch list will be paid by the Contractor and will be deducted from the Contractor's final payment.
- C. The Contractor is required to obtain all final releases from governmental and regulatory agencies having jurisdiction over the project with the assistance from the Architect / Engineer and Owner (if required).

1.10 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list to the Architect. 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 indoors**, as applicable.
 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.

1.11 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

- B. Record Drawings: Maintain and submit one set of blue - or black-line white prints of Contract Drawings and Shop Drawings.
1. 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 prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy 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. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Note related Change Orders, Record Drawings and Product Data, where applicable.

- D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
 - 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 Drawings, and Record Specifications, where applicable.

- E. Miscellaneous Record Submittals: 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.

1.12 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Provide instructors experienced in operation and maintenance procedures.
 - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 - 3. Schedule training with Owner, through Architect, with at least seven calendar days advance notice.
 - 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
 - 1. System design and operational philosophy.
 - 2. Review of documentation.
 - 3. Operations.
 - 4. Adjustments.
 - 5. Troubleshooting.
 - 6. Maintenance.
 - 7. Repair.

1.13 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
 - 1. Refer to other Division 1 - specification sections for additional cleaning as required and where applicable.

- 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 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. 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.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, attics, and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - i. Clean transparent materials, including glass in doors. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish glass, taking care not to scratch surfaces.

- j. Remove labels that are not permanent.
- k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - (1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- 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. Replace parts subject to unusual operating conditions.
- n. Heating, Ventilating Air Conditioning Work and Refrigeration Contractor shall replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - 1) Clean ducts, blowers, and coils if units were operated without filters during construction.
- o. Electrical Work Contractor shall clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- p. Leave Project clean and ready for occupancy.
- q. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

1.14 TRANSMITTAL TO OWNER

- A. Collect, organize, label, and package ready for reference.
 - 1. Provide cardboard file boxes for submittals.
 - 2. Provide cardboard drawing tubes with end caps for transparencies.
 - 3. Bind print sets with durable paper covers.
 - 4. Label each document (and each sheet of drawings) with "PROJECT RECORD DOCUMENTS - This document has been prepared using information furnished

by _____" [insert the contractor's name], and the date of preparation.

- B. Submit to the Architect for transmittal to the Owner, unless otherwise indicated.

1.15 REMOVE TEMPORARY FACILITIES

- A. At the completion of the work prior to final payment, remove all temporary facilities entirely from the site, including, but not limited to, the following:
 - 1. Field offices, trailers, temporary toilets, temporary enclosures, dust barriers and other temporary protection devices.

1.16 SUBMITTALS REQUIRED PRIOR TO FINAL PAYMENT

- A. Contractor must satisfy all requirements of Sections 01700 and 01900 prior to submitting for Final Payment.
- B. A closeout checklist will be provided to the Contractor when he/she is substantially complete. The Contractor is instructed to mark each submittal with the corresponding item number on the checklist. All warranties must have the Owner Name, Project Name, Architect Project Number and Warranty Periods. If all documents are not received in this format, the submittal will be rejected and the Contractor will be instructed to pick these documents up at the Architect's office for correction.
- C. Submittals required prior to final payment shall be in accordance with "Checklist" include, but are not limited to, the following items:
 - 1. Completed Operations Insurance Certificate - ACORD Form.
 - 2. Affidavit of Payment of Debts and Claims - AIA Document G706.
 - 3. Affidavit of Release of Liens - AIA Document G706A.
 - 4. Consent of Surety Company to Final Payment - AIA Document G707.
 - 5. Certification of Wages in accordance with New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25.
 - 6. 10% one year Maintenance Bond on the form provided in this specification.
 - 7. Manufacturers' product warranties, Special written guarantees and warranties, maintenance warranty, etc. in accordance with Section 01900, various specification sections and the table of contents of the Project Manual. This is in addition to the one-year guarantee covered by the Maintenance Bond and in addition to the Contractor's one-year guarantee.

- a. Guarantee shall be signed and sealed by Officer of the Contracting Firm and shall be notarized.
 - b. Roofing Warranty: Manufacturer's Roofing Warranty must be accompanied by Contractor's proof of all payments to the Roofing System Manufacturer.**
8. Project Record Drawings, (As-Built Drawings), Record Specifications, Record Product Data, and Miscellaneous Record Submittals.
 - a. Note: As-Built Drawings shall be submitted to the appropriate Engineer(s)/ Architect.
 9. Operation and Maintenance Manuals and Instructions.
 - a. Note: Operation and Maintenance Manuals shall be submitted to the appropriate Engineer(s) / Architect.
 10. Balancing Reports for Heating, Ventilating, Air Conditioning and Refrigeration systems.
 11. Certificate of Occupancy / Copies of all Building Department inspection approvals.
 12. In accordance with requirements of N.J.S.A. 52:32-44. Contractor must submit accurate list of all subcontractors and suppliers. Contractor must provide a certification that all proofs of business registration for all subcontractors and suppliers are maintained on his/her file.
 13. **Roofing Projects:** The Contractor must submit the following documents:
 - a. Copy of the paid statement from the roofing manufacturer for all materials including cost of the roofing warranty.
 - b. Original signed and notarized letter from the roofing manufacturer (on their letterhead) which certifies that the Contractor has paid the roofing manufacturer in full including cost of the roofing warranty.
 14. All approvals and final releases from governmental and regulatory agencies have jurisdiction including, but not limited to: NJDCA, Local Construction Department, NJDEP, etc., as required.

END OF SECTION 01700

CLOSEOUT CHECKLIST

| | | |
|--|---|------------------|
| Owner | | |
| Title | | |
| Project # | | Contract: |
| Contractor | | |
| Substantial Completion Date: | | Updated: |
| <p>Refer to Specification Sections 01700 and 01900 for closeout requirements. All Warranties must have the Owner Name, Project Name, Project Number and Warranty Periods. As-Built drawings, O&M manuals, reports, certifications, warranties, punch list must be submitted to Engineer for review.</p> | | |
| Item No. | Documents & Warranties Required For Closeout | Status |
| 1 | Completed Operations Insurance Certificate ACORD Form | |
| 2 | Completed Operation Insurance Statement (Sample Enclosed) | |
| 3 | AIA Document G701 Certificate of Substantial Completion | |
| 4 | AIA Document G702 Affidavit of Payment of Debts & Claims | |
| 5 | AIA Document G706A Affidavit of Release of Liens | |
| 6 | AIA Document G707 Consent of Surety to Final Payment | |
| 7 | Certification that all wages have been paid - NJ Prevailing Wage Act, N.J.S.A. 34:11-56.25 | |
| 8 | 10% - one year Maintenance Bond - must be on form provided in spec book - sample attached | |
| 9 | Record Project Manual indicating changes or company letter stating no changes. | |
| 10 | One Year Contractor's Guarantee Covered by Maintenance Bond - Sample Attached | |
| 11 | Operation Instructions & Maintenance Manuals (2 each in 3-ring binder) | |
| 12 | Record Drawings. Indicate As-Built drawings with company name, address and date (1 Paper Set & 2 CD's) | |
| 13 | Final Payment Requisition & Board Voucher/Invoice (3) Contractor will not be closed out until all paperwork is submitted | |
| 14 | Certificate of Approval/Acceptance | |
| 15 | Confirmation that FVHD has received "hard copies" (not electronic) of all shop drawing submittals. | |
| 16 | Copies of all outstanding certified payroll reports or letter on Contractor's letterhead stating all outstanding certified payroll sheet and manning reports have been sent to the Owner. | |
| 17 | Letter on Contractor's letterhead stating date of substantial completion and requesting punch list review to Architect & Engineer | |
| 18 | Final Punch list signed and dated indicating completion of all work | |
| 19 | Accurate list of all subcontractors and suppliers | |
| 20 | Balancing & Testing Reports (HVAC) | |
| 21 | Fire Alarm Certification (ELECTRICAL) | |
| 22 | Warranties - Refer to Specification Section 01900 for required warranties for each trade | |
| 23 | All approvals and final releases from governmental and regulatory agencies have jurisdiction including, but not limited to: NJDCA, Local Construction Department, NJDEP, etc., as required. | |

SECTION 01800 - TIME OF COMPLETION AND LIQUIDATED DAMAGES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the requirements for completion of interim milestone events and final completion of all work required by the contract documents.
- B. Related Sections:
 - 1. Items of Work attached to the "Certificate of Substantial Completion" and establishing "Final Completion Time" as per Section 00800.
- C. This section also establishes the relation of liquidated damages for failure to complete the interim milestone events or final completion requirements within the time requirements stated herein.

1.2 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- A. It is understood that each Contractor has mutual responsibility to complete its work in sequence with the work of the other Contractor and to allow the other Contractor access to the work site so that it may complete its work within the times established.
- B. Completion of the Contract Work by the Contractor shall be time of the essence.
- C. The Contractor shall work overtime, additional shifts, weekends or holidays to complete the work on time with no additional cost to the Owner.
 - 1. Scarce resources will be no excuse for not completing the work on time.
 - 2. **No work may take place during the school day in any occupied area. All work, in occupied areas, shall be performed on second shift (3:00 PM - 11:00 PM) before June 22, 2020 or after September 1, 2020. Contractor must review proposed work activities and have approval of Owner and Architect prior to proceeding.**
 - 3. **Work may take place during regular shift and second shift (7:00 AM - 10:00 PM) after June 22, 2020 until October 30, 2020; however, the Contractor is required to review and coordinate all work activities with the Architect and School Facilities Director prior to commencing with the work.**
 - a. **Contractor to review permitted work hours to comply with the local "Noise Ordinance".**

4. **Contractor is required to include the cost of any premium time, second shift and weekend work which may be required in their bid to complete the work within the indicated milestone dates.**
- D. Substantial and final completion of the Work shall include, but is not limited to, final inspection and acceptance by the Local Building Officials.
- E. **Milestone No. 1**
1. Sign Contract, no later than **twenty (20) calendar days** from **Notice of Award**; on or about **February 25, 2020**.
 2. Contractor submits Bonds and Insurance **ten (10) calendar days** from **Notice of Award**.
 3. **Notice to Proceed** shall be within **three (3) business days** of date of signing Contract; on or about **March 18, 2020**.
- F. **Milestone No. 2**
1. **Time Critical submittals** for special equipment, fixtures, etc. shall be submitted within **twenty (20) calendar days from Notice to Proceed**.
- G. **Milestone No. 3**
1. Submission of all remaining technical shop drawing submittals shall be submitted within **thirty (30) calendar days from Notice to Proceed**.
- H. **Milestone No. 4**
1. Physical work at the site shall commence on or about **June 22, 2020**.
- I. **Milestone No. 5A**
1. Substantial Completion of **Pomona Preschool** shall be on or before **157 Calendar Days from the Notice to Proceed, August 21, 2020**.
 2. Liquidated Damages - \$500.00 / Calendar day of delay.
- J. **Milestone No. 5B**
1. Substantial Completion of **Arthur Rann Elementary School** shall be on or before **227 Calendar Days from the Notice to Proceed, October 30, 2020**.
 2. Liquidated Damages - \$500.00 / Calendar day of delay.

K. **Milestone No. 6**

1. Final Completion of all Work including punch list items and closeout documents, no later than **31 Calendar Days from Substantial Completion, November 30, 2020.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

L. In accordance with N.J.S.A. 18A:18A-19, the Owner shall deduct from the Contract Price, for any wages paid by the Owner to any inspector or inspectors necessarily employed by for the work of this project, for any number of days in excess of the number of days or indicated dates allowed in milestones above. Such sums shall be part of the Liquidated Damages indicated herein after.

M. The Liquidated Damages set for above shall be in addition to other consequential losses or damages the Owner may incur by reason of such delay, such as, but not limited to, the cost of additional architectural and engineering services resulting from the delay, additional costs to the Owner for payments to other Contractors resulting from delay, including acceleration costs by other contractors to recover the defaulting contractor's delay.

N. The said Liquidated Damages are fixed and agreed upon by and between the Contractor and the Owner because of the impracticality and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amounts shall be retained from time to time by the Owner for the current periodical payments.

1. The Liquidated Damages set for above are intended to compensate Owner for loss of use during the period of delay, for other delay during construction which may result further delay in substantial and/or final completion dates and for any acceleration costs by other contractors to recover the defaulting contractor's delay.
2. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.

O. The Owner shall have the right to deduct the total amount any Liquidated Damages for which the Contractor may be liable from any monies otherwise due the Contractor, including any retainage under control of the Owner.

P. The surety upon the Performance Bond furnished by the Contractor shall be liable for any such Liquidated Damages for the Contractor may be liable, to the extent that the Contractor shall not make settlement therefor with the Owner.

END OF SECTION 01800

FVHD-5192 / 5193

1:01800-3

SECTION 01900 - GUARANTEES AND WARRANTIES

PART 1 - GENERAL

1.1 CONTRACT

- A. Period for all guarantees and warranties shall commence at date of substantial completion for the entire project, as determined by the Architect.
- B. The Contractor's guarantee on all work, covered by Maintenance Bond . . . **One (1) Yr.**
 - 1. The Maintenance Bond shall represent a continuing obligation of the Prime Contractor and his/her Subcontractor(s) to repair/replace defective materials and/or labor of products installed in the project for **one (1) year** from the date of Substantial Completion.
- C. Provide all required warranties indicated in specification sections which include but not limited to the following:

1.2 GENERAL CONSTRUCTION WORK

- A. Lawns & Grasses as specified in Section 02930.
 - 1. Warranty lawns and grasses unconditionally for one full growing season beginning from date of final acceptance.
 - 2. Beginning from the date of final acceptance, all lawns and grasses shall be alive and in satisfactory growth at end of warranty period.
 - 3. Replace any material that is diseased or 25% dead or more at no cost to the Owner.
- B. Self-Drying Finishing Underlayment as specified in Section 03452. (Trowel)
 - 1. Special Project Warranty: Submit a written warranty signed by the manufacturer, the contractor, and the installer, guaranteeing to correct failures in materials and workmanship which occur within the warranty period, including those attributable to abnormal aging, without reducing or otherwise limiting any other rights to correction which the Owner may have under the contract documents.
 - a. The warranty shall include responsibility for removing and replacing other work as necessary to accomplish repairs or replacement of materials covered by the warranty.
 - 1) Warranty period: Minimum **two (2) years** after date of substantial completion.

C. Unit Masonry Work as specified in Section 04200.

1. Flexible Copper Flashing:

a. Special warranty:

- 1) Manufacturer shall warrant flexible flashing material for **life of the wall**.
- 2) Begin warranty from the Date of Substantial Completion.

D. Agreement to Maintain Roofing

1. Roofing Contractor shall agree to maintain the roof systems and related roof sheet metal work in a weathertight and watertight condition for a period of **two (2) years** starting from the date of Owner's acceptance in accordance with special Maintenance Contract outlined herein.
2. During the Maintenance Period, the Roofing Contractor agrees that within 24 hours of receipt of notice from the Owner he/she will inspect and make immediate emergency repairs to defects or to leaks in the roof systems and related flashing work. He/She further agrees that within a reasonable time, he/she will restore the affected items to the standard of the original specifications. All emergency and permanent work during the life of the agreements to maintain the roof systems will be done without cost to the Owner, except in the event it is determined that such leaks were caused by abuse, lightning, hurricanes, tornado, hailstorm, other unusual climatic phenomena of the elements, or failure of related work (except related roof sheet metal work included under the Agreement) installed by other parties.
3. Agreement to maintain roofing system shall be in a written form acceptable to the Owner.

E. Preformed Metal Roofing as specified in Section 07410.

1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
2. Warranty Period: **Two (2) years** from approved date of Substantial Completion.
3. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - a. Finish Warranty Period: **Thirty-five (35) years** from approved date of Substantial Completion.
4. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

- a. Warranty Period: **Twenty (20) years** from approved date of Substantial Completion.
- F. Flashing, Sheetmetal and Roof Accessories as specified in Section 07600.
- 1. Warrant Fluoropolymer coating to remain free, under various atmospheric conditions, from peeling, checking, or cracking, and chalking in excess of numerical rating of 8 when measured in accordance with ASTM D659-86, or fading in excess of 5 N.B.S. units during warranty period.
 - a. The Warranty period shall be **twenty (20) years** which starts on the approved date of Substantial Completion.
- G. Joint Sealer Assemblies as specified in Section 07900.
- 1. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - a. Warranty Period: **Five (5) years** from date of Substantial Completion.
 - 2. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - a. Warranty Period: **Five (5) years** from date of Substantial Completion.
 - b. Submit two (2) copies of written guarantee for all sealant work of this section signed by the Contractor and the sealant manufacturer for a period of **five (5) years** from the date of acceptance by the Owner.
 - c. Guarantee shall further state that all exterior sealant will be guaranteed against:
 - 1) Adhesive or cohesive failure in joints where movement is under maximum 25% extension or compression.
 - 2) Any crazing greater than 3 mils in depth developing on surface of material.
- H. Wood Doors as specified in Section 08211 **Life of Installation.**
- 1. Submit written agreement in door manufacturer's standard form signed by the manufacturer and contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show photographing of construction below its face veneers, or do not conform to tolerance limitations of NWMA.
 - 2. The warrant shall also include refinishing and reinstallation as may be required due to repair or replacement of defective doors.

- I. Overhead Coiling Counter Doors as specified in Section 08331.
 - 1. Standard Warranty: **Two (2) year** warranty from date of shipment against defects in materials and workmanship.

- J. Fiberglass Reinforced Polyester (FRP) Doors as specified in Section 08410.
 - 1. Provide written warranty signed by Manufacturer and Contractor, agreeing to replace aluminum entrances which fail in materials or workmanship within **ten (10) years** of acceptance. Failure of materials or workmanship includes excessive leakage or air infiltration, excessive deflections, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering, and defects in hardware, weatherstripping and other components of the work.
 - 2. Limited Lifetime Warranty covering the following:
 - a. Failure of corner joinery.
 - b. Core deterioration.
 - c. Delamination or bubbling of door skin.

- K. Aluminum Storefronts as specified in Section 08415.
 - 1. Total Storefront Installation
 - a. The responsible contractor shall assume full responsibility and warrant for **one (1) year** the satisfactory performance of the total storefront installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings.
 - b. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
 - 2. Window Material and Workmanship
 - a. Provide written guarantee against defects in material and workmanship for **three (3) years** from the date of final shipment.
 - 3. Glass
 - a. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
 - b. Warranty period shall be for **ten (10) years**.
 - 4. Finish
 - a. Warranty period shall be for **twenty (20) years** from the date of final shipment.
 - b. Provide organic finish warranty based on AAMA standard 2605.

- L. Finish Hardware as specified in Section 08700.
1. Guarantee workmanship and material provided against defective manufacture. Repair or replace defective workmanship and material appearing within period of **one (1) year** after substantial completion.
 2. Provide **twenty-five (25) year** factory warranty on manual surface door closers against defects in material and workmanship from date of occupancy of project.
 3. Provide **five (5) year** factory warranty on exit devices, locksets and overhead stops against defects in material and workmanship from date of occupancy of project.
 4. Provide **ten (10) year** factory warranty on locksets against defects in material and workmanship from date of occupancy of project.
- M. Glass and Glazing as specified in Section 08800.
1. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - a. Warranty Period: **Ten (10) years** from date of Substantial Completion.
 2. Fabricator's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass fabricator agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - a. Warranty Period: **Ten (10) years** from date of Substantial Completion.
 3. Manufacturer's Limited Warranty on Fire-Rated / Impact Glazing: Written warranty, made out to the Owner and signed by manufacturer, warrants only that the product will be free of manufacturing defects resulting in material obstruction through the glass area and/or edge separation and changes in properties of the interlayer for a period of **five (5) years** from the date of purchase, provided the Products have been properly shipped, stored, handled, installed and maintained.
 - a. Limitation of Remedy - Inspection: The remedy for product proved to be defective under the terms of this warranty is limited to shipment of replacement product. With respect to all claims under this warranty, the Manufacturer shall have the right to inspect any and all products alleged to be defective.
- N. Security Window Film as specified in Section 08870.
1. Manufacturer and the Authorized Window Film Dealer (collectively referred to as "Seller") warrant for **twelve (12) years** from installation, and provided that the

product is maintained in accordance with the Window Care Instructions below, that the Safety & Security Window Film will:

- a. Maintain Adhesion Properties without blistering, bubbling, or delaminating from the glass,
- b. Maintain Appearance without discoloration,
- c. Maintain Strength, Tear, and Penetration Resistant Properties as defined in product literature.

Warranty Applicable with additional purchase & installation of Impact Protection System Adhesive or Profile:

2. With the purchase of Impact Protection Profile or Impact Protection Adhesive on all four (4) sides of the window, for the entire project, Manufacturer and the Authorized Window Film Dealer agree to extend the terms of this warranty an **additional two (2) years**, for a total of a **fourteen (14) year** warranty. This includes the film, attachment system, and labor. No changes are made to the glass breakage warranty.
3. The Impact Protection System Adhesive or Profile warranty applies to new Safety & Security Window Film installations. The adhesive or profile Product will meet Product specifications in effect at time of installation. The warranty period is **twelve (12) years** from the date of installation for a two sided application, and **fourteen (14) years** for a 4 sided application. This shall not cover failure due to disintegration of the underlying substrate, movement of the structure exceeding specification for elongation and/or compression, changes in appearance of the adhesive due to dirt or other contaminants, tampering or other modifications applied after installation.
 - a. Film warranty is void if the attachment system is removed for reasons other than to replace product found defective under this warranty. Application of Non-System Manufacturer wet glaze attachment system voids the Safety & Security Film Warranty. If the product does not conform to this warranty, the sole and exclusive remedy is:
 - 1) Replacement of the quantity of film proved to be defective; and,
 - 2) Provide removal and reapplication labor of like quality product free of charge.
4. Seller also warrants against glass failure due to thermal shock fracture, (maximum value of \$500 per window) caused only as a direct result of the application of Safety & Security Window Film provided the film is applied to recommended types of glass and the glass failure is reported to the Seller within the specified time (listed below) from the start of the installation. Glass breakage coverage is only valid for Safety & Security Window Films.
 - a. **Sixty (60) months** coverage against thermal shock fracture,
 - b. Any glass failure covered by this warranty must be reviewed by Seller prior to

repair, and only covers film and glass replacement.

O. Resilient Flooring as specified in Section 09650.

1. Vinyl Composition Tile:

- a. Special Warranty - Manufacturer warrants its regular (first quality) commercial floor products to be free from manufacturing defects for **five (5) years** from date of purchase.
 - 1) **Within One Year:** If a defect covered by this warranty is reported to the manufacturer in writing within one year of purchase, Manufacturer will supply new material of the same or similar grade sufficient to repair or replace the defective material. Manufacturer will also pay reasonable labor costs.
 - 2) **Within Two Years:** If a defect covered by this warranty is reported to the manufacturer in writing after one year but within two years of purchase, Manufacturer will supply new material of the same or similar grade sufficient to repair or replace the defective material. Manufacturer will also pay fifty (50%) percent of reasonable labor costs.
 - 3) **After Two Years:** If a defect covered by this warranty is reported to the manufacturer in writing after two years but within five years of purchase, Manufacturer will supply new material of the same or similar grade sufficient to repair or replace the defective material. Manufacturer will not pay for labor costs.
 - 4) Manufacturer does not warrant the installers' workmanship. Workmanship errors should be addressed to the contractor who installed the floor.

P. Carpet Entry Mats as specified in Section 09682.

1. Warranty Performance Requirements:

- a. Special Project Warranty: In addition, a written special project warranty, executed by the Contractor and the Installer, agreeing to repair or replace carpet which fails in material or workmanship within a period of **two (2) years**, which starts at the date of substantial completion, without any cost to the Owner, and agreeing to repair or replace other defects beyond Contractor's/Installer's/Manufacturer's controls, as judged by the Architect, at Owner's expense at prevailing rates.
- b. **Lifetime Limited** Carpet Tile Warranty.
- c. **Lifetime** Duracolor Stain Warranty.
- d. **Lifetime** Static Warranty.

1.3 ELECTRICAL WORK

- A. General Requirements Electrical as specified in Section 260010.
 - 1. Unconditionally guarantee in writing all materials, equipment and workmanship for a period of **one (1) year** from date of acceptance by Owner. During the guarantee period, repair or replace, at the Electrical Trade Contractor's expense, any materials, equipment or workmanship in which defects may develop and provide free service for all equipment and systems involved in the contract during this guarantee period. Beneficial use of any system by any of the Trade Contractors during construction does not constitute acceptance by the Owner. Time period of this beneficial use cannot be included in the guarantee period.

- B. Lighting Control Devices as specified in Section 260923.
 - 1. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.
 - a. Failures include, but are not limited to, the following:
 - 1) Faulty operation of lighting control devices.
 - b. Warranty Period: **Two (2) years** from date of Substantial Completion.

- C. Interior Lighting as specified in Section 265119.
 - 1. LED light fixtures provided as a part of this project shall be provided with a **five (5) year** warranty.

END OF SECTION 01900

PART 2 - GENERAL CONSTRUCTION WORK

SECTION 02000 - FIELD ENGINEERING & LAYOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to Work of this Section.

1.2 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for field-engineering and surveying services including, but not limited to, the following:
 - 1. Land survey work related to the construction of site improvements.
 - 2. Civil-engineering services related to site work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 02005: "Project Closeout-Site" for submitting final as-built survey with Project Record Documents and recording of Owner-accepted deviations from indicated lines and levels.
- C. Work under this contract shall be coordinated with the Owner's continued use of the premises during construction.

1.3 SUBMITTALS

- A. Submit proof of private underground utility mark out for all areas that are not covered by the NJ One Call service. Perform a utility mark-out verification survey as prepared by a licensed land surveyor per part 3.1 D.
- B. Certificates: Submit a signed & sealed plan prepared by a licensed professional Land Surveyor identifying the location and elevation of constructed improvements (as-built survey).
- C. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of "Submittals" and "Project Closeout" Sections.

1.4 QUALITY ASSURANCE

- A. Certificates: Per part 1.3 B above.
- B. Qualifications: **Engage a professional Land Surveyor licensed in New Jersey to perform required land-surveying services to layout the work.**

- C. **All survey work (construction stake out, as-built surveys, etc..) shall be performed by a licensed Professional Land Surveyor in accordance with N.J.A.C. 13:40-5.1(d).**

PART 2 – PRODUCTS

2.1 CONTROL POINTS

- A. The drawings depict benchmarks that shall be used when establishing the elevation of all final and interim site improvements. The contractor will be proceeding at its own risk if any other elevation shown on the plans is used for establishing the elevation, slope, or position of any improvement.
- B. Should it be necessary to demolish a designated benchmark, the **contractor's licensed land surveyor** shall establish and maintain new survey control points in safe (undisturbed) locations on the subject property. Replacement survey control points shall be concrete monuments, iron bars or iron pipes in accordance with the municipal land use law. Include the relocated control points and their coordinates on the as-built survey that is submitted for Substantial Completion.
- C. Notify the engineer if any designated benchmarks are to be relocated and provide new benchmark location and information to engineer as a Submittal. Also see Note B above.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. IDENTIFICATION: THE PLANS WILL IDENTIFY EXISTING CONTROL POINTS.
- B. VERIFY LAYOUT INFORMATION SHOWN ON THE DRAWINGS, IN RELATION TO THE BENCHMARKS PROVIDED ON THE PLANS, BEFORE PROCEEDING TO LAY OUT THE WORK. LOCATE AND PROTECT EXISTING BENCHMARKS AND CONTROL POINTS. PRESERVE PERMANENT REFERENCE POINTS DURING CONSTRUCTION.
 - 1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
 - 2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.
- C. ESTABLISH AND MAINTAIN A MINIMUM OF 4 PERMANENT BENCHMARKS ON THE SITE, REFERENCED TO DATA ESTABLISHED BY SURVEY CONTROL POINTS.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. The benchmarks shall be located throughout the project site so as to provide reasonable access to control points in all areas of development.

- D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Underground utilities such as water, gas, electric, data, and cable television lines must be **field verified before commencing with demolition work.**
1. Prior to demolition or construction, verify the location and invert elevation at points of connection of storm sewer piping.
 2. Engage the services of a private underground utility mark-out service to locate all utilities and sewers within the limits of demolition and construction that are not marked by the NJ One Call service.
 - a. Compare the location of utilities identified in the underground utility mark out with those shown on the existing conditions plan. Survey (locate) any utilities shown on the mark out that significantly differ from the location and alignments shown on the construction documents. Mark the surveyed utility locations on a copy of the existing conditions plan and furnish same to the engineer not less than 1 week prior to the commencement of site demolition work.
 3. Maintain utility mark-out throughout the duration of demolition & construction activities until such time as no further ground penetrations will occur per N.J.S.A. 48:2-73 et seq..

3.2 PERFORMANCE

- A. Work from control points, lines and levels established by the project survey and construction plans. Establish benchmarks and markers to set lines and levels at each stage of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
 2. As construction proceeds, check every major element for line, level, and plumb.
- B. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.
1. Record deviations from required lines and levels, and advise the Engineer when deviations occur.
 2. On completion of underground drainage system work, survey the location of termination points and changes in alignment of piping before backfilling, so the location can be recorded on the as-built plan submitted for Substantial Completion. Locate other major site improvements and other work requiring field-engineering services as work progresses and include this information on a certified survey showing dimensions, location, angles, and elevations of construction and site work. The major site improvements shall show ties (perpendicular dimensions) to demonstrate compliance with the design intent.
- C. Site Improvements: Locate and lay out all site improvements, including walkways, pavements, walls, stakes, grading fill and topsoil placement by using designated benchmarks.

1. The site grading plans show spot elevations at key locations along pavements, sidewalks, doorways, stairways, ramps and other areas. The spot elevations are to be followed.
- D. Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.
- E. Final As-Built Survey: Prepare a final as-built survey showing actual construction of proposed work for the Project.
 1. Verify that all slopes and elevations shown on the Grading Plan have been achieved.
 2. Furnish 2 copies of the as-built survey to the Engineer as part of the Substantial Completion phase, per the Project Closeout requirements in section 02005.
 3. Substantial Completion will not be approved without the as-built survey.

3.3 COORDINATION

- A. Work under this contract shall be coordinated with the Owner's on-going use of the premises during construction. It may be necessary to phase work in some locations to allow the Owner to move school buses and plan alternate parking measures.

3.4 VERIFICATION OF LINES AND GRADES

- A. While in the normal course of performing calculations relative to layout work, the land surveyor in responsible charge of construction stake-out work shall review the information shown on the drawings and note any inconsistencies that deviate from the design intent and standard practice. The inconsistencies shall be presented to the engineer not less than 2 days prior to the anticipated construction related to the stake out work. These inconsistencies may include, but are not limited to the following:
 1. Juxtaposed numbers that simply do not make sense.
 2. A labeled dimension that is noticeably different than the graphic representation of said dimension.
 3. A spot elevation that deviates from an established uniform grading pattern and/or would otherwise create an undesirable change in elevation at an unusual location.
 4. An invert elevation identified on a gravity fed utility that would result in a flat pipe run or a pipe run that is back pitched and/or would result in unconventional operation of said utility.
 5. A grate elevation shown on a storm sewer structure that would inhibit positive drainage.

END OF SECTION 02000

SECTION 02005 – PROJECT CLOSEOUT - SITE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to Work of this Section.
- B. Closely Related requirements specified in other Sections:
 - 1. Division 01 Section: Applications for Payment
 - 2. Division 01 Section: Temporary Facilities, SPC
 - 3. Division 01 Section: Final Cleaning
 - 4. Division 01 Section: Record Documents
 - 5. Section 02000: Field Engineering & Layout

1.2 DESCRIPTION OF REQUIREMENTS

- A. Perform closeout work and submit as-built survey required to establish Substantial Completion, as defined by the Conditions of the Contract.
- B. Perform closeout work and submit closeout documents required to establish Final Completion.

1.3 REQUIREMENTS FOR SUBSTANTIAL COMPLETION

- A. Notification: In sufficient time to permit scheduling of punch list inspection, but not less than two weeks in advance of such site observation, submit written notice requesting establishment of Substantial Completion, and including:
 - 1. A statement that the Work shall be substantially complete by a certain date.
 - 2. A list of work items which shall not be complete at requested date of Substantial Completion, with reasons therefore and with anticipated dates for completion of such work items.
 - 3. Supporting documentation for completion as required by these Contract Documents.
 - 4. Statement of pending insurance change-over requirements.
 - 5. Specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents, except those that require a date of Substantial Completion.
 - 6. Provide date upon which the engineer will receive an as-built survey of all new improvements.

- B. Prior to site observation establishing Substantial Completion, complete the following:
1. Obtain and submit release enabling the Owner's full, unrestricted use of the Work and access to construction areas.
 2. Deliver spare parts, extra stock of material and similar physical items to the Owner.
 3. Complete final cleaning requirements.
 4. **Submit As-built Survey to the Engineer at least 3 days before requesting the substantial completion site observation.**
 5. Obtain and submit final sign-offs or approvals from all applicable outside agencies.
- C. Site Observation Procedures:
1. Upon receipt of all information noted above (more specifically the as-built survey), the Engineer will either proceed with the Substantial Completion observation, or advise the Contractor of prerequisites to observation.
 2. Following the Substantial Completion observation, the Engineer will either prepare the Certificate of Substantial Completion, or will advise the Contractor (via punch list report) of Work which must be performed before the Certificate will be issued. List of Work requiring completion will be the responsibility of the Contractor, appended as necessary to satisfy the punch list.
 3. The Engineer will schedule the Final Completion Site observation when requested and assured in writing by the contractor, that the Substantial Completion punch list work has been completed.
 4. The results of the completed substantial completion site observation will form the initial punch-list for Final Completion.

1.4 REQUIREMENTS FOR FINAL COMPLETION

- A. General: Complete the following as soon as possible after Substantial Completion and before requesting the final site observation and acceptance:
1. Submit releases of items and encumbrances or alternate evidences, as required by the General and Supplementary Conditions.
 2. Submit certificates of insurance for products and completed operations, if such coverage is required to continue beyond Final Completion, complying with insurance requirements of the General and Supplementary Conditions.
 3. Submit final statement of accounting, as specified in this section.
 4. Submit a certified copy of the Engineer's initial punch-list for Final Completion report of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance by the owner.
 5. Submit Consent of Surety.
 6. Submit Record Documents.
 7. Complete other work, deliveries and document submittals required for Substantial Completion but accepted as exceptions to requirements for Substantial Completion.
- B. Final Statement of Accounting:
1. Prepare and submit a statement reflecting adjustments to the Contract sum, including:

- a. The original Contract Sum.
 - b. Additions and deductions resulting from:
 - i. Previous Change Orders and Construction Change Directives.
 - ii. Deductions for uncorrected work.
 - iii. Deductions for re-inspection payments.
 - iv. Other adjustments as applicable.
 - c. Total Contract Sum, as adjusted.
 - d. Previous payments.
 - e. Sum remaining due.
2. The Architect or Engineer will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders or Construction Change Directives.
- C. Final Completion Site Observation:
1. The Engineer will observe the Work within 7 days after receipt of the Contractor's certified notice (see A.4 above) that the Work, including punch-list items from the initial punch-list for Final Completion report, has been completed.
 2. Upon completion of observation, the Architect or Engineer will either prepare final Certificate for Payment (minus retainage), or will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.
 3. If necessary, the observation procedure will be repeated, and **all engineering labor and material costs incurred by the Engineer related to the additional site observation and reporting shall be back charged to the contractor. The engineer will not provide an endless number of site observations and reports in an attempt to properly close out the project.**
- D. Final Closeout: Upon completion of Work, as evidenced by observation of completed work and receipt of required closeout documents in acceptable form, a final Certificate for Payment will be issued and final payment made, in accordance with the Conditions of the Contract. Contractor's obligations thereafter shall be limited to correction or replacement of defective Work in accordance with the terms of the general warranty, special warranties and the Conditions of the Contract.

END OF SECTION 02005

SECTION 02070 - SELECTIVE DEMOLITION

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 DESCRIPTION OF WORK

- A. Extent of selective demolition work is indicated on the drawings.
- B. Type(s) of Selective Demolition Work: Demolition requires the selective removal and subsequent offsite disposal of the following:
 - 1. Portion(s) of building structures, as indicated on drawings and as required, to accommodate new construction.
 - 2. Removal and protection of existing fixtures and equipment items indicated as "salvage".
- C. Removal Work Specified Elsewhere:
 - 1. Mechanical and Electrical Work - Cutting non-structural concrete floors and masonry walls for underground piping, conduit, and for above grade piping, conduit, is included with the work of the respective mechanical and electrical.
- D. Related Work Specified Elsewhere:
 - 1. Remodeling construction work and patching is included within the respective sections of specifications, including removal of materials for re-use and incorporated into remodeling or new construction.

1.3 SUBMITTALS

- A. Proposed Demolition Activities: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's Representative for review prior to commencement of work. Provide starting and ending dates for each activity as appropriate.
 - 1. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.
 - 2. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
 - 3. Sequence construction so as to minimize obstruction of exits and provide temporary alternate exits, as required by authorities having jurisdiction.
 - 4. Coordinate with Owner's continuing occupation of portions of existing buildings, and with Owner's reduced usage during summer months.

- B. Photographs: Photograph existing conditions of structure, surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to starting work.
- C. Project Record Documents:
 - 1. Indicate unanticipated structural, electrical, or mechanical conditions.

1.4 JOB CONDITIONS

- A. Occupancy: Owner will be continuously occupying areas of the buildings immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will severely impact Owner's normal operations.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
 - 1. Conditions existing at time of commencement of contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
 - 1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of the buildings.
 - 2. Protect existing finish work, from being damaged during the project, which is to remain in place and becomes exposed during demolition operations.
 - 3. Protect floors with suitable coverings so as to leave the flooring in same condition at end of job.
 - 4. Construct temporary insulated solid dustproof partitions, where required, to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors, if required.
 - 5. Remove protections at completion of work.
- D. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner, including but not limited to concealed interior and exterior utility lines not properly investigated by the contractor, prior to commencement of demolition work.
- E. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Explosives: Use of explosives will not be permitted.
- G. Utility Services: Maintain existing interior and exterior utilities indicated to remain, keep in service, and protect against damage during demolition operations.
1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 INSPECTION

- A. Prior to commencement of selective demolition work, inspect areas in which work will be performed.
1. **Photograph existing conditions of structures, surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to starting work.**
 2. Commencement of work shall constitute acceptance of conditions. Any necessary remedial work required to correct any unsatisfactory conditions, found after the start of installation, will be provided at no cost to the Owner.
 3. Prior to the commencement of work review the demolition activities with the Owner's representative to identify additional salvage items requested by the Owner.

3.2 PREPARATION

- A. Cover and protect furniture, equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.
- B. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the buildings.
1. Provide weatherproof closures for exterior openings resulting from demolition work.
- C. Locate, identify, stub off and disconnect utility services that are not indicated to remain.
1. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of buildings. Provide minimum of 72 hours advance notice to Owner if shut-down of service is necessary during change-over.

3.3 DEMOLITION

- A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
 - 1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - a. The Contractor shall use caution when cutting into existing masonry construction (eg.: concrete slabs, single wythe and cavity wall construction) as there may be undocumented utilities within the cavity or built into the cores of cmu wall construction or under the floor slab. The contractor shall perform all necessary investigation prior to demolition work to determine the presence of existing utilities within construction to be demolished, including but not limited to radar, thermal, impact echo, etc. The Contractor shall pay for restoring / repairing the existing construction if utilities are cut and proper selective demolition investigation work was not performed. Refer to Section 01050.
 - 2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.
 - 3. Provide services for effective air and water pollution controls as required by authorities having jurisdiction.
 - 4. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.
- B. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative / Architect in written, accurate detail. Pending receipt of directive from Owner's Representative / Architect rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.4 SALVAGE MATERIALS

- A. Salvage Items: Where indicated on Drawings as "Salvage-Deliver to Owner", carefully remove indicated items, clean, store and turn over to Owner and obtain receipt.
 - 1. Unless otherwise indicated all materials, items, equipment, etc. resulting from demolition work shall be removed from the site at the Contractor's expense.
- B. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance remain the property of the Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish and other materials resulting from demolition operations from building sites. Transport and legally dispose of materials off site.
- B. If hazardous materials are encountered during demolition operations, notify the Owner's Representative immediately, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.
- C. Burning of removed materials is not permitted on project sites.

3.6 CLEAN-UP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment and demolished materials from the sites. Remove protections and leave interior areas broom clean.
- B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 02071 - SELECTIVE SITE DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. General Conditions, Supplementary Conditions and Division 1-General Requirements, apply to work of this section.

1.2 WORK INCLUDED

- A. Remove, except as specifically excluded by provisions of this section:
 - 1. Existing work obstructing new work.
 - 2. Existing work indicated on Drawings to be removed.
 - 3. Existing work below grade obstructing new construction.
- B. Remove from the project site, and dispose of, materials and equipment removed as selective demolition work, except:
 - 1. Materials and equipment to be incorporated into new work.
 - 2. Materials and equipment to be delivered to Owner.
- C. Phasing: Perform selective demolition in phases as required by Owner's use of portions of the site.
- D. Install 6 foot high temporary construction security fencing around the perimeter of all construction areas to protect the general public. No exact amount of fencing is shown on the drawings and the Owner and/or Engineer reserves the right to require as much fencing as needed to maintain construction site safety.

1.3 RELATED SECTIONS

- A. 02110 Site Clearing

1.4 SUBMITTALS

- A. Schedule of Operations: Include coordination for shut-off, capping, and continuation of storm sewer and utility services as required, together with details for dust and noise control protection, in sufficient detail to ensure uninterrupted progress of Owner's on-site operations.
- B. Details: Proposed modifications to removal work as required by the Contract Documents.

- C. Proof of obtaining **PRIVATE** underground utility mark-out and survey prior to any land disturbance that results into the excavation of subgrade soils, per NJ State regulations governing subsurface excavations. Note the NJ One Call service does not usually mark underground utilities within the interior of a site. The contractor must have all areas marked out, where excavation into subgrade soils will occur.
- D. Copy of Soil Conservation District notification.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Supervision: Perform selective demolition under the direct supervision of a qualified construction superintendent, experienced in type of construction involved.
 - 2. Skills: Where selective demolition terminates at existing work to remain, perform work using craftsmen skilled in materials and systems involved.
- B. Pre-demolition Work:
 - 1. Engage the services of a private underground utility location company to mark the location of all underground utilities present within construction areas and at least 50 feet beyond, where subgrade earthwork is proposed. Note that the NJ One Call Utility Mark out service will not provide on-site utility mark out in most instances, which is why the contractor must engage its own private utility mark-out service.
 - 2. Compare the utility locations shown on the Existing Conditions plan with those locations marked in the field. Using a licensed professional land surveyor, survey the location of any utility found to be in a significantly different location, a location not identified on the plan, or in a location that will conflict with future construction. Provide a drawing (to scale) to the Engineer illustrating the utility locations found in the field, versus those represented on the Existing Conditions Plan at least 1 week prior to demolition or earthwork.
 - 3. Test Pits: Perform open excavation test pits in areas required by the Engineer, to verify the depth, size, and alignment of underground utilities that may be in conflict with future construction or are found to be located significantly different than the Existing Conditions plan depicts. Survey the size, depth, and alignment of the affected utility and report this information to the engineer (overlay this information on a copy of the Existing Conditions plan). Include all costs associated with at least 3 test pits in base bid. No separate payment will be made for test pits.
 - 4. All utilities shall be field verified by the contractor prior to the ordering of materials, or the procurement of equipment related to the installation of underground utilities.
- C. Compaction of Demolition Areas.
 - 1. The contractor must (shall) engage a **geotechnical engineer** and a materials testing and inspection company to verify the compaction of all backfill, fill, and other earthwork relative to disturbance caused by demolition work. Also see section 02200 for soil compaction, testing and geotechnical engineering oversight.
 - 2. If demolition work occurs in areas slated for lawn construction, do not over compact the subgrade soils or fill. Use only light duty earthwork equipment in lawn areas.

1.6 PROJECT CONDITIONS

- A. Coordinate this work with the work of other sections to avoid any delay or interference with other work.

- B. Condition of Structure(s): By submitting its bid, the Contractor represents that it has fully examined the conditions of the building(s), grounds, and other existing site improvements surrounding all work areas. The Owner assumes no responsibility for actual condition of items or structure(s) to be selectively demolished.
 - 1. Conditions existing at time of inspection for bidding will be maintained by Owner insofar as practicable. However, variations within the site and surrounding structures may occur by Owner's and/or adjacent property owner's daily use of the premises prior to start of selective demolition work. No claims for additional cost due to such variations shall be considered.
 - 2. The Contractor shall continually assess the structural adequacy of nearby structures as demolition proceeds and conditions are uncovered. If previously unseen or unknown structural elements are encountered, promptly advise the Engineer and wait for instructions before proceeding further.
 - 3. The contractor shall photograph and catalog the structural condition of each adjacent structure, paying particular attention to the condition of existing foundations, evidence of cracks, poor condition of masonry, cracking in plaster or walls, or other poor site conditions that exist before demolition and construction begins. The purpose of this exercise is to obtain a record of adjacent site conditions before work begins, in order to evaluate potential future claims for property damage caused by vibrations, noise, seismic disturbances, or direct impact. NOTE: The contractor is encouraged to video record the condition of each work area in addition to obtaining a photographic record.
 - 4. The contractor shall periodically assess the structural condition of adjoining areas throughout demolition and construction, in order to insure that the condition of the neighboring area is not being compromised. The contractor shall repair any damage to neighboring areas, to the satisfaction of the owner and the local Building Department, at no additional cost to the Board of Education.
 - 5. If the contractor fails to photographically document the condition of existing structures as noted above, then, by default, it assumes all responsibility for mitigating claims of property damage. Photographically documenting the condition of neighboring areas does not relieve the contractor from any responsibility for repairing subsequent damage to the property. The contractor will be held responsible for repairing any property damage that can be justifiably linked to the contractor's demolition or construction activities.

- C. Protection:
 - 1. Provide protective measures as required to provide free and safe passage of persons to and from occupied portions of the site and around areas of demolition.
 - a. Ensure that adequate illumination, exit signs and warning signs, included as Temporary Facilities work, are in place whenever such passage is required.
 - b. Ensure that all areas are kept in a clean and safe condition at all times. Install temporary construction fencing as needed, and as directed by the owner's representative to insure the safety of the public.

- c. If pavements or other hard surfaces are to be removed in public areas, and not immediately restored, install temporary bituminous pavement patch, and maintain said patch until permanent hard surfaces are installed.
 2. Provide necessary shoring, bracing, and support to prevent movement, settlement, or collapse of structures or elements adjacent to areas being demolished, and adjacent facilities and neighboring residential structure to remain.
 3. Protect existing finished work to remain in place that becomes exposed during demolition operations from damage.
 4. Protect existing curbing, fencing and walls that are designated to remain. Terminate demolition at clean control joints or if joints or seams are not present, carefully trim or sawcut materials to provide a mendable edge that can be re-secured or otherwise treated for assimilation into future work or work to remain.
 5. Provide temporary weather protection during interval between demolition, removal of existing construction on exterior surfaces and installation of new construction, to ensure that no water leakage or weather related damage occurs to subgrades or subbases.
- D. Traffic: Conduct demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Comply with requirements of authorities having jurisdiction.
- E. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations. Do not interrupt existing utilities serving occupied or facilities in use, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
1. If utility systems, including mechanical or electrical systems, are encountered, that are not indicated to remain but give evidence of being in use, promptly advise the Engineer for instructions before proceeding.
- F. Advise the Owner, in writing, of encounter with materials suspected to be of a hazardous nature. These materials are not to be handled or removed under this Contract.

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas in which work is to be performed. Report to the Owner all prevailing conditions that will adversely affect satisfactory execution of work. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Starting work constitutes acceptance of the existing conditions and the Contractor shall then be responsible for correcting all unsatisfactory and defective work encountered at his/her expense.

- C. The following is repeated from another section in these specifications to insure that the contractor recognizes this provision of the contract:
1. The contractor shall photograph and catalog the structural condition of each adjacent structure, paying particular attention to the condition of existing foundations, evidence of cracks, poor condition of masonry, cracking in plaster or gypsum wall board, or other poor site conditions that exist before demolition and construction begins. The purpose of this exercise is to obtain a record of adjacent site conditions before work begins, in order to evaluate potential future claims of property damage caused by vibrations, noise, seismic disturbances, or direct impact. NOTE: The contractor is encouraged to videotape the condition of each area in addition to obtaining a photographic record.
 2. The contractor shall periodically assess the structural condition of neighboring areas throughout demolition and construction, in order to insure that the condition of the neighboring areas is not being compromised. The contractor shall repair any damage to neighboring areas, to the satisfaction of the owner and the local Building Department, at no additional cost to the Board of Education.
 3. If the contractor fails to photographically document the condition of existing structures as noted above, then, by default, it assumes all responsibility for mitigating claims for property damage. Photographically documenting the condition of neighboring areas does not relieve the contractor from any responsibility for repairing subsequent damage to the property. The contractor will be held responsible for repairing any property damage that can be justifiably linked to the contractor's demolition or construction activities.

3.2 PREPARATION

- A. Prior to commencement of work, the Contractor and Owner's Representative shall inspect respective demolition areas and:
1. Tabulate and, if appropriate, photograph (and videotape or digitally record if feasible) existing conditions which could be misconstrued as damage resulting from selective demolition work and,
 2. File record photographs with Owner's Representative prior to starting work and,
 3. Confirm that items to be removed by the Owner have been removed.
 4. Contact NJ One Call service and appropriate utility companies to schedule utility location mark-outs. The contractor shall also engage the services of an independent utility location service to identify and mark the location of all utilities within the scope of construction where excavation will occur. All costs associated with the location of utilities shall be borne by the contractor. The contractor may not excavate down below pavement courses and into soil without having obtained an underground utility mark out in said area. The demolition of pavements and walkways does not require underground utility mark out, unless said demolition extends into stone subbase or soils below.

3.3 SITE DEMOLITION

- A. General: Perform work using methods which comply with governing regulations, and which produce proper surfaces to receive new work.
 - 1. Demolish to limits not less than what is depicted on the demolition plan or to the nearest seam or joint if within 5 feet thereof. If no seam or joint exists within 5 feet of the depicted demolition limit then saw cut (uniformly) along the designated line. The contractor may elect to increase the limits of demolition work to extend to a nearby control joint to avoid saw-cutting work, however, all additional areas that are demolished must be restored in-kind to a "like new" condition at no additional project cost.
- B. Concrete and Masonry: Demolish in small sections. Cut at junctures near construction to remain by using power-driven saws or hand tools; do not use power-driven impact tools.
- C. Locate equipment and promptly remove debris to avoid imposing excessive loads on structures.
- D. Demolish foundations, footings, and slabs, in their entirety, in all areas where future construction will occur or where future underground utilities will be constructed to provide required clearances for new work.
- E. Conduct pavement demolition and milling work to insure that remaining pavement courses are protected during and after work. Repair all damaged bituminous pavement sub courses to new condition if damaged during site demolition or milling work.
- F. Do not open and expose pavement subbase and subgrades when inclement weather is forecast and areas cannot be reasonably restored and protected from damage. Make necessary provisions to ensure continuous watertight integrity of work to remain.
- G. Explosives: Use of explosives is not permitted.

3.4 DUST CONTROL

- A. Comply with governing regulations pertaining to prevention of raising excessive dust and dirt.
- B. Use water sprinkling, temporary enclosures, and other suitable methods to minimize amounts of dust and dirt rising and scattering in the air.
 - 1. Do not use water sprinkling when it may create hazardous or objectionable conditions such as ice, flooding, polluted runoff, or damage.

3.5 REMOVAL AND CAPPING OF UTILITIES

- A. Verify the activity of underground utilities encountered during site demolition and cap any utility found to be abandoned. Verify same with the Owner before capping & abandoning.

3.6 SALVAGE MATERIALS

- A. Verify that the owner has salvaged all materials from the site that they want to retain.
- B. Carefully dismantle (retain hardware and fasteners in re-sealable containers) all features that the owner asks to retain including but not limited to lawn furniture, signs, fencing, playground and/or recreational equipment. Store salvaged materials off site and/or deliver salvaged materials to a location specified by the owner.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish and other materials resulting from demolition operations from project site. Do not bury demolished materials on the project site. Transport and legally dispose of materials off site.
- B. On site burning of removed materials is not permitted.
- C. Storage or sale of removed materials shall not be permitted on the site, except storage of materials to be re-used or furnished to Owner.

3.8 CLEAN-UP AND REPAIR

- A. Return structure(s) and surfaces to remain to condition existing prior to start of demolition work. Repair adjacent construction and surfaces soiled or damaged by excessive demolition work to original or better condition.
- B. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave work areas broom clean.

END OF SECTION 02071

SECTION 02100 - TRAFFIC CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General & Supplementary Conditions.

1.2 SUMMARY

- A. The Contractor will not be allowed to close any driveways to traffic without express written permission from the owner. Parking lot aisles may be closed provided that this is coordinated with the Owner. The Contractor shall plan and carry out its work to provide for the convenient and safe passage of all vehicular and pedestrian traffic at all times directed by the Owner.
- B. All costs involved in traffic control shall be borne by the Contractor.
- C. It is the Contractor's responsibility to ensure the safe passage of vehicular and pedestrian traffic throughout the project limits, at all times, until final acceptance of the project by the Engineer. This includes the installation of temporary pedestrian-safe walkways as directed by the Owner.
- D. Maintenance and protection of traffic with minimum interference are of the first importance. The Contractor shall provide, and maintain to the satisfaction of the Owner's Representative and/or Engineer, an adequate and safe means of passage of vehicular and pedestrian access to all areas of the subject property. There shall be no disruption of access to nearby buildings adjoining or affected by the work without prior approval of the Owner. Sufficient width shall be provided at driveways to allow safe and convenient turning through them, and the outside edges shall be plainly marked by lights, barricades, or other devices approved by the Engineer. The Contractor shall notify the Owner at least 48 hours prior to the time it proposes to begin any work which will interfere with their normal passage. Pavement areas shall be kept clean of construction materials at all times.
- E. The Contractor shall provide adequate means of access for fire, police, and emergency vehicles throughout the duration of the project.
- F. Traffic shall be maintained throughout the project area during construction. At least one 12-foot lane shall be maintained for traffic during all construction periods and at least two 12 foot lanes at all other times.
- G. Watchmen and flag men shall be employed by the Contractor for the protection of any equipment entering, leaving or crossing active traffic lanes or as may be required for the routing of any traffic around or through the construction. Watchmen and flag men will be employed by the Contractor at his own expense.

- H. The Contractor shall be responsible for the complete maintenance of driveways adjoining construction areas. The driveways shall be kept free of all obstructions and kept in a smooth riding condition at all times. All pot holes, washouts, cave-ins, etc., developing during this period shall be properly filled in with material by methods approved by the Engineer.
- I. The contractor shall obtain detouring and traffic control requirements from the local police department for work that is planned within the public right of way (e.g. construction or the movement of materials and equipment into and out of the project site). The Contractor shall adhere to all local traffic control requirements at no additional cost to the owner.
 - 1. Engage an off duty police officer if required by the local police traffic safety officer to control traffic along South 8th Avenue for all work or equipment placed within or proximate to the public right of way.

PART 2 - PRODUCTS

2.1 TRAFFIC CONTROL DEVICES

- A. Before beginning work on any stage of the project, the Contractor shall furnish and install all specified warning signs, barricades, wood traffic guides, lights, flares, and other devices necessary, in the opinion of the Engineer and/or the local police department traffic safety officer, to protect the public during that phase of its operations.
- B. All necessary regulatory and warning signs shall be in accordance with Chapter 6 of the Manual on Uniform Traffic Control Devices, latest Edition, and shall be supplied and installed by the Contractor as directed by the Engineer or local police department traffic safety officer. When such signs are no longer required, the Contractor shall immediately and carefully remove and store them on the project site at locations approved by the Architect until they are reused on the project or removed by the Contractor.
- C. Barricades shall be painted with diagonal orange and white stripes. The orange color used on barricades shall conform to standard colors as shown on highway color tolerance charts published by the Federal Highway Administration. Conformance will be visually determined by comparison with the highway color tolerance charts using the Munsell Notation according to ASTM D1535. Color tolerance charts are on file in the office of the Department's Sign Architect at 1035 Parkway Avenue, Trenton, New Jersey. Type III A barricades shall not be used adjacent to traffic lanes.
- D. Traffic cones shall be of plastic or rubber, of 28-inch minimum overall height, 1-3/4 inch minimum outside diameter at the top, and 7-1/2 inch minimum outside diameter at the bottom tapering to a 14-inch minimum square base. The minimum weight of the cones shall be 7 pounds exclusive of attachments. They shall be reflective orange with the color molded into the plastic. They shall be kept clean and bright for maximum target value. Traffic cones shall be reflectorized and may be equipped with steady burning lights for nighttime use, if so directed by the Architect. The cones shall be subject to the Architect's approval before and during the time of their use on the project.

- E. Low intensity battery operated flashing warning lights shall conform to the Specifications on file at the office of the NJ DOT Department's Bureau of Safety, 1035 Parkway Avenue, Trenton, New Jersey. These Specifications require, in part, that the flashing lights be weather-proof, and reasonably tamper-proof and theft-proof; be equipped with a 7-inch minimum diameter yellow plastic lens; shall operate with a flash rate between 55 and 75 flashes per minute with a flash duration of not less than 18 percent of each flash cycle; each light shall have a minimum effective intensity of 10 candle power and shall be inspected and cleaned daily so as to maintain the lights in proper working condition.
 - 1. High intensity battery operation flashing warning lights shall conform to the Specifications therefore on file at the office of the NJ DOT Department's Bureau of Safety, 1035 Parkway Avenue, Trenton, New Jersey. These Specifications require, in part, that the flashing lights be weatherproof, and reasonably tamper-proof and theft-proof; be equipped with a 7-inch minimum diameter yellow plastic lens; shall operate with a flash rate between 55 and 75 flashes per minute and have a minimum effective intensity of 100 candle power and shall be inspected and cleaned daily so as to maintain the lights in proper working condition.
 - 2. Flashing warning lights and steady burn lights shall be installed and maintained at such locations as the Engineer or municipal officials may determine are necessary to adequately warn oncoming traffic of the existence of the work zone.
 - 3. Steady burning lights and low intensity flashing warning lights shall be kept lit from 1 hour before sunset until 1 hour after sunrise, and through all hours of fog, smog, and other adverse atmospheric conditions affording insufficient visibility for the safe operation of traffic. High intensity warning lights shall be operated 24 hours per day.

- F. No work which will interfere with traffic, or restrict the width of pavement available for traffic, shall be performed on Saturdays, Sundays or legal holidays, without prior approval by the owner.

- G. Except as necessary during actual working hours, and then only with the specific approval of the Architect or Engineer, the Contractor shall not occupy with his equipment, materials or personnel, any roadway or sidewalk area within or adjacent to the project that is open to traffic.

- H. Competent, trained, and uniformed traffic directors shall be employed at every point where the Contractor's equipment is working immediately adjacent to or is entering, leaving or crossing active traffic lanes. The traffic directors shall be employed continuously for the full time such conditions exist as determined by the Engineer. Traffic directors will be employed by the Contractor at his own expense.
 - 1. The contractor shall contact the local police department to obtain any local requirements for traffic control should any activity that could potentially disrupt the free flow of traffic in public rights of way. The contractor shall adhere to whatever traffic control requirements are set forth by the local police department, including but not limited to the part-time hiring of off-duty police officers for traffic control duty. Traffic directors (off-duty police officers) will be employed by the Contractor at his own expense.

- I. All signs denoting the closure of the main school driveway and detouring of traffic shall be furnished, erected, and maintained in a substantial manner to be approved by the local police department, and shall be maintained so as to provide maximum visibility and legibility at all times.
- J. Signs, lights, barricades, and all other warning and protective devices shall be established, repaired, relocated, and removed by the Contractor at the locations and times and in the manner directed by the Engineer or local police department having jurisdiction.
- K. Wherever a detour may be established, the Contractor shall obtain approval two weeks in advance from the local police department and shall provide warning signs as necessary in accordance with Chapter 6 of the MUTCD.
 - 1. Should the Contractor feel additional detours are necessary, it will be its responsibility to get prior approval from the Municipality, in the case of local roads or from the State, in the case of State highways, or from the County, in the case of County roads, to route traffic on or off their roads. In addition, the Contractor will be responsible for notifying local police, school boards, fire companies, first aid units, etc., of the detour, prior to its inception, as a condition of approval by the Engineer or Owner.
 - 2. If the Contractor uses drums to delineate traffic hazards on the project site, such drums shall be of steel or plastic, approximately 36 inches high and a minimum of 18 inches in diameter. They shall have alternating orange and white reflective stripes, with a minimum of two white stripes per drum. Ballast weight shall not exceed 50 pounds. A drain hole shall be provided near the bottom of the drum to prevent the accumulation of rain water.

2.2 METHOD OF MEASUREMENT

- A. No separate payment will be made for Supply, Maintenance and Protection of Traffic as described above and in the MUTCD. Payment for all installation, maintenance, lighting, relocation, maintaining breakaway barricades, lights, torches, sandbags, construction signs, traffic cones, drums, vertical panels, barricades Type I, II or III with flashers, provisions for temporary driveways, sidewalks with soil aggregate, Class 1-2; temporary curb, temporary bituminous pavement, and all else necessary for and incidental to the maintenance and protection of traffic shall be included in various items listed in the Proposal.
- B. No separate payment for uniformed traffic directors will be made; the cost of which will be included by the Contractor in the price bid for the various items in the proposal.
- C. No separate payment will be made for the items as hereinbefore described including but not limited to, installation, maintenance in good condition, relocation, removal, and disposal of all the items as hereinbefore described; all materials, labor, equipment, and all else necessary therefore or incidental thereto for completion of this item as specified herein.

PART 3 - EXECUTION

3.1 EXECUTION

- A. Maintenance and protection of traffic shall be coordinated with local authorities. Adhere to all traffic control requirements established by the local police department and other regulatory bodies having jurisdiction.
- B. All traffic control devices shall be in operation prior to the commencement of any construction activities in the traveled way.
- C. Any traffic control devices which are lost, stolen, destroyed or deemed unacceptable while their use is required on the project, shall be replaced by the Contractor without additional compensation. Any additional control devices required by field conditions shall be supplied by the Contractor without additional compensation.
- D. Obtain all required road opening permits from authorities having jurisdiction as applicable.

END OF SECTION 02100

SECTION 02110 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.2 SECTION INCLUDES

- A. Provide site clearing, within contract limits (area of disturbance), or within other limits if indicated, including:
 - 1. Clearing removing and disposing of surface features in conflict with new construction.
 - 2. Protection of existing trees, shrubs and other landscape features and improvements to remain.
 - 3. Removal of trees and other vegetation.
 - 4. Topsoil stripping and stockpiling.
 - 5. Clearing and grubbing.
 - 6. Removal of at-grade and above-grade improvements including but not limited to: benches, fences, pavements, curbing, concrete walkways, trees, shrubs, and other site amenities within the scope of construction.
 - 7. Re-install site amenities indicated on the drawings to be temporarily removed and/or relocated. Consult with the owner's representative first to determine the desired location for the re-installation.
- B. Installation of temporary 6' high construction fencing around all construction areas. Exact location and quantity to be specified by the owner or Engineer. The installation of temporary construction fence is further explained in section 02071.
- C. Cleaning sediment and debris from the existing storm sewer system as further defined herein.

1.3 RELATED SECTIONS

- A. Section 02071: Selective Site Demolition

PART 2 – PRODUCTS

2.1 TEMPORARY CONSTRUCTION FENCE

- A. Furnish and install temporary metal construction security fence, 6 feet high, with lockable access gates at appropriate locations that facilitate work and site access. An exact quantity is not specified. The contractor shall estimate an amount of fencing, assuming that the entire construction area shall be fenced in a continuous manner at one time.

1. Locate the temporary construction fencing along the property frontage of South 8th Avenue, along with temporary barricades to prevent public access to the parking lot and work areas during construction. Supplement existing fencing along the rear of the parking lot to prevent access from the rear. Fencing may be moved as work is completed in one area and progresses to the next, provided that all areas that are re-opened to the public are restored to a safe and operable condition.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with governing Soil Erosion and Sediment Control Standards.
- B. Provide site clearing, within contract limits, or within other limits if indicated, including:
 - 1. Protection of existing trees, shrubs and other landscape features and improvements to remain.
 - 2. Removal of trees and other vegetation.
 - 3. Topsoil stripping and stockpiling.
 - 4. Clearing and grubbing of trees and other vegetation.
 - 5. Removal of at-grade and above-grade improvements including but not limited to: benches, fences, pavements, curbing, concrete walkways, trees, shrubs, poles, lighting, and other site amenities within the scope of construction.
 - 6. Cleaning of existing surfaces at the completion of work and as required to adhere to dust control and OSHA safety requirements.
 - 7. Cleaning sediment and debris from all storm sewers located within the construction area and downstream to the nearest outfall, or public sewer main (whichever is closer).
 - 8. Re-install site amenities indicated on the drawings to be temporarily removed and/or relocated. Consult with the owner's representative first to determine the desired location for the re-installation.
 - 9. Sweep and clean all existing pavement areas within the scope of work to remove sand, gravel, and broken pavement pieces.
- C. Remove all waste materials cleared from the site and dispose of in a legal manner off-site.
- D. Install temporary 6 foot high construction security fencing around all work areas. As a minimum assume entire limit of disturbance is fenced, however, the exact location and quantity of fencing shall be dictated by the Owner.
- E. Clear only as many trees as needed to accommodate the new drywell construction. The use of shoring is suggested to minimize clearing limits while also providing OSHA compliant excavations.

3.2 PROTECTION OF EXISTING IMPROVEMENTS

- A. Provide barricades, covering, or other types of protections necessary to prevent damage to existing improvements indicated to remain in place.

- B. Restore damaged improvements to their same condition as at start of work, as acceptable to Owner of damaged improvements.

3.3 PROTECTION OF EXISTING TREES AND VEGETATION

- A. Protect existing trees, and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing. Protective guards shall as a minimum consist of bright orange-colored, 3' high PVC brightly colored snow fence installed around the drip line (perimeter) of existing trees and foliage to remain.
- B. Provide protection for roots over 1-1/2 inches diameter cut during construction operations. Coat cut faces with emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
- C. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner reviewed by the Engineer. Replace trees which cannot be repaired and restored to full- growth status, as determined by arborist. Employ qualified arborist acceptable to Owner to evaluate damage and to repair damages to trees and shrubs.
- D. Remove lower branches of trees to provide required clearance for construction. Trim other branches as needed to accommodate new construction.

3.4 REMOVAL & RELOCATION

- A. Removal of At-Grade and Above-Grade Improvements: Remove pavements, concrete slabs, curbs, walks, concrete slabs, fences, fence post remains, gravel, foliage, and other existing improvements in way of new work and elsewhere as specifically indicated. Include removal of crushed stone, gravel, or other bases at slabs, paving, and other work removed under this requirement.
- B. Fill depressions caused by work of this section, except topsoil stripping, with satisfactory well-graded soil aggregate material unless further excavation or earthwork at location of depression is indicated. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact to 95 percent maximum dry density per ASTM D-1557 testing requirements as amended.
- C. The limits of pavement removal shall be clearly measured and marked in the field prior to the removal operation. Pavement shall be cut with a suitable masonry/bituminous saw along the marked limits in order to provide a uniform clean edge. If severe cracking or "alligator skin" appearance is observed along or within 10 feet of the specified limit of pavement removal, then the limit of pavement removal shall be increased as needed to insure structural stability of adjacent areas. For this reason, it is important for the contractor to visit the project site before submitting his/her bid and examine the condition of areas within the construction limits.

- E. Relocation of at-grade and above-grade site amenities shall include carefully dismantling said amenities and re-installing same at a location identified by the owner's representative. The contractor shall also furnish and install all required hardware and replacement parts damaged or missing after dis-assembly. Re-installation shall also include proper anchoring and foundations for said amenities in similar fashion as they currently exist.
- F. The construction limits shown are approximate and the contractor shall remove only the minimal amount of site improvements needed for the proper construction of the improvements shown.

3.5 REMOVAL AND CAPPING OF UTILITIES

- A. Verify the activity of underground utilities encountered during site clearing (and demolition) and cap any utility found to be abandoned. Verify same with the Owner before capping & abandoning.

3.6 CLEANING OF STORM SEWER SYSTEM

- A. Clean sediment and debris from all on-site storm sewer inlets, manholes and pipes on a regular basis and immediately prior to the date of substantial completion.
- B. All storm sewers and inlets located downstream of construction areas and/or convey storm water runoff from construction areas shall be cleaned of all sediment and debris regularly and at the completion of the project. The extent of downstream storm sewer cleaning shall be limited to the storm sewer pipes exiting the subject property that connect into the nearest municipal storm sewer system, including the municipal storm sewer structure into which the connection is made.
 - 1. The contractor will be responsible for cleaning any storm sewers and inlets that are affected by the contractor's work or construction practices.

3.7 DISPOSAL OF WASTE MATERIALS:

- A. Burning on Owner's property is not permitted.
- B. Remove waste materials from Owner's property and dispose of off site in legal manner.
- C. Tree stumps and other waste materials shall not be buried on the site.

END OF SECTION 02110

SECTION 02200 - EARTHWORK - SITE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SECTION INCLUDES

- A. Provide earthwork & grading required for the project, including:
 1. Earth Excavation, subgrade soil removal, replacement fill, backfill and compaction to provide suitable subgrades for pavement reconstruction.
 2. Earth Excavation, fill and earthmoving to provide site subgrades required by finish grades shown in sidewalk areas, along walls, along stairways and along the edge of construction.
 3. Drainage fill course (min. 4" thickness) **under all new walkways on grade, under concrete paving, and elsewhere as indicated**, to provide a capillary break.
 4. Additional bank run sand fill materials as required.
 5. Removal and disposal of excavated material not required for, or not suitable for, the work.
 6. Backfilling voids resulting from the removal and disposal of existing underground obstructions.
 7. Design and engineering of shoring, sheet piling and bracing related to earthwork.
 8. Grading & preparation of subgrade soils in areas that are to become lawn.

1.3 RELATED SECTION

- A. Section 02071: Selective Site Demolition
- B. Section 02920: Soil Preparation

1.4 REFERENCED STANDARDS

- A. ASTM American Society for Testing and Materials.
 1. D2487 Test Method for Classification of Soils for Engineering Purposes.
 2. D1556 Field Density Tests, Sand Cone Method.
 3. D1557 Standard Test Methods for Moisture-Density Rotations of Soils and Soil-Aggregate Mixtures Using 10 Lb. Rammer and 18-In. Drop.
 4. D2167 Field Density Tests, Rubber Balloon Method.
 5. D2922 Standard Test Methods for Density of Soil and Soil-Aggregate in place by Nuclear Methods (Shallow Depth).

- B. New Jersey Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition.

1.5 SUBMITTALS

- A. Compliance: Submit the following reports to the Architect, with copy to Engineer:
 - 1. Schedule for earthwork operations.
 - 2. Location of site receiving spoil material and certification of acceptance.
 - 3. Test reports on borrow material, fill, and screened top soil.
 - 4. Geotechnical Engineering and Compaction Test Reports certifying that all earthwork, pavement subgrade preparation, and excavations were properly backfilled and thoroughly compacted.
 - 5. Testing certification that all imported soils are free of contamination and deleterious materials.

1.6 QUALITY ASSURANCE

- A. Contractor shall provide a soils gradational analysis, from the supplier, of any imported soil fill (or on-site soil fill) to be used as structural fill under pavements. The contractor is responsible for determining the amount of imported soil needed to establish the lines and grades shown on the construction drawings.
- B. Engage the services of a qualified geotechnical engineer and materials testing and inspection company at contractor's expense to oversee and certify all earthwork activities. See section 3.9 below. Provide test reports verifying specified compaction and required soil bearing capacities have been established **PRIOR TO CONSTRUCTING NEW WORK**.
- C. Note that the Owner reserves the right to engage their own geotechnical engineer for this project and in doing so does not relieve the contractor of its obligation to engage the services of its own geotechnical engineer.

1.7 REGULATORY REQUIREMENTS

- A. Comply with the applicable provisions of codes, standards and specifications referenced in this section.
- B. Adhere to soil stabilization provisions contained in the plan.

1.8 PRODUCT HANDLING

- A. Handle and transport materials to avoid dropping and dispersion of material onto public rights of way or other areas outside of the construction area.
- B. Promptly remove materials deposited or eroded onto areas described above, and leave area clean.

- C. Maintain segregation of dissimilar materials.

1.9 PROJECT CONDITIONS

- A. Site Information:

- 1. All excavation is considered earth as defined in part 1.10.

- B. Existing Utilities:

- 1. Protect existing sewers and utilities noted to remain. Provide adequate means of support and protection for remaining utilities during earthwork operations.
 - a. Existing utilities shown on Drawings are based on field observations and mapping obtained from local utility companies. All locations are represented as approximate.
 - b. If excavation locates existing utilities which are to remain and if such utilities are not located as shown on Drawings, record locations and identifications of utilities on Record Document drawings. Provide same information to the Engineer.
 - c. Adhere to other utility location requirements specified in other sections of the specifications.
- 2. Uncharted, or incorrectly charted, piping or other utilities: If encountered during excavation, consult utility owner immediately for directions. Cooperate with utility companies in keeping services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
- 3. Do not interrupt existing utilities or sewers serving facilities occupied and used by Owner or others, at any time, except when notice has been filed and permission granted.
- 4. Refer to Pre-demolition work (section 02071) as it pertains to utility locations, test pits, and mark-out.

- C. Use of explosives is not permitted.

- D. Protection of Persons and Property:

- 1. Perform earthwork operations only after installation of temporary construction fencing, perimeter safety barricades, warning lights and other protective measures as specified and as required by authorities having jurisdiction. Maintain protective measures in fully effective condition throughout the period of earthwork operations.
- 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. This includes the erection of temporary wooden framing to support adjacent structures during trench excavations.
- 3. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dry out. Maintain moist condition for root system and cover exposed roots with wet burlap. Paint root cuts of 1 inch diameter and larger with emulsified asphalt tree paint.
- 4. Protect the on-site soils at all times, by limiting excavation to those areas that can be suitably and continuously drained. Standing water is not permitted anywhere on the site.

1.10 DEFINITIONS

- A. Earth - Soil, clay, loose stone, hard pan, abandoned foundations, abandoned piping, concrete and masonry rubble, broken paving and other materials, with the exception of boulders and solid rock which require drilling or blasting, or both for removal.
- B. Suitable Material - Earth, which is capable of being compacted to the required density at the proper moisture content, and which is free of topsoil, roots, trash, debris, frozen material, organic matter and other foreign matter, and has a pH between 5 and 6.5. The limits of rock as part of suitable material shall not exceed 4 (four) inches in size. The remainder of rock shall be classified as unsuitable.
- C. Unsuitable Material - Material not classified as "suitable".
 - 1. On site bituminous concrete shall be considered unsuitable material and shall be disposed of off site in a legal manner.

PART 2 - PRODUCTS

2.1 MATERIAL AVAILABILITY

- A. On-site soils are suitable for re-use by the contractor, only in strict conformance with the recommendations of the geotechnical engineer.

2.2 FILL

- A. Contractor shall provide a soils gradational analysis, from the supplier, of any imported soil fill (or on-site soil fill) to be used as controlled compacted (structural) fill under pavements. The contractor is responsible for determining the amount of imported soil needed to establish the lines and grades shown on the construction drawings.
- B. Provide a certification from a licensed testing laboratory for all imported fill stating that the soil fill has been tested and is free of contamination or other deleterious material, per NJ DEP clean fill specifications. Virgin granular material from a quarry does not require testing and certification.

- C. On-site and imported granular soil that is suitable for use as controlled compacted (structural) fill shall be free of organic matter, ash, cinders, and debris, and shall comply with the following gradation:

| <u>Sieve Size</u> | <u>Percent by Weight Passing Square Mesh Sieve</u> |
|-------------------|--|
| 3" | 100 |
| ¾" | 70-100 |
| #4 | 30-80 |
| #50 | 10-35 |
| #200 | <15 |

2.3 DRAINAGE FILL SUBBASE

- A. Beneath Portland Cement Concrete:

Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inches sieve and not more than 5 percent passing a No. 4 sieve. Compacted to 95% MPD per ASTM D1557.

2.4 WATER

- A. Provide water as required to assure proper moisture content for compaction of all subgrade soils, fill, and subbase material as specified.

PART 3 - EXECUTION

3.1 EROSION CONTROL

- A. Install and maintain all Soil Erosion & Sediment Control measures prior to land disturbance and maintain throughout the duration of the project until permanent vegetation is established.
- B. Do not permit excavated soils to wash into the public roadway or onto adjacent properties.
- C. Wash and sweep hard surfaces around the site daily to keep dust and scattered soil debris to a minimum.

3.2 EXCAVATION

- A. General Site Excavation is Earth, and includes excavation to provide required elevations indicated. Perform all site excavation, rough grading, compaction, proof-rolling and placement of fill before excavating for foundations. If underground obstructions are encountered during earthwork operations and said obstructions are abandoned and serve no purpose, remove said obstructions to provide suitable clearances for underground utility lines and new surface improvements.
- B. Inspection: Before proceeding with excavation in any area, confirm that the underground utility mark-out and survey has been performed. Maintain mark-out throughout the duration of work.
- C. Unsuitable clean fill material may be reused as surface fill around new construction to establish required subgrades in lawn areas prior to the placement of screened topsoil. All excess unsuitable fill that is removed from building areas noted above, that cannot be re-used, shall be removed from the project site and disposed of in a legal manner off-site.
- D. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction. Unauthorized excavation, and remedial work directed shall be at Contractor's expense.
 - 1. Backfill and compact other unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed.
- E. Soft soils should be locally removed and replaced with suitable controlled compacted fill material as defined herein. In no case shall the size of any particle exceed 3 inches in diameter.
- F. Stability of Excavations: Slope sides of excavations to comply with OSHA codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- G. Shoring and Bracing:
 - 1. Comply with local codes and authorities having jurisdiction. Provide materials in good serviceable condition.
 - 2. Provide performance verification, in accordance with the provisions of Part 1 of this section.
 - 3. Maintain shoring and bracing in excavations throughout period when excavations are open. Carry down shoring and bracing as excavation progresses.
- H. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.
- I. Inclement Weather Protection:
 - 1. Protect all excavations and earthwork areas from damage caused by weather. Maintain smooth site grading throughout construction to insure the proper conveyance of overland storm water flow patterns. Standing water shall not be permitted at any time.

2. Soils damaged by excessive saturation or other contamination shall be replaced with Granular Material, or as specified by the Geotechnical Engineer at the contractor's expense.

3.3 DEWATERING

- A. Prevent surface water and subsurface water from flowing into excavations and construction areas and surrounding area. Perform any or all of the following means to divert water from construction areas:
 1. Install a temporary diversion along the limits of construction to re-direct surface runoff.
 2. Use a bypass pumping system to de-water trenches and excavations. Provide sufficient piping to divert the pumped water away from the work areas. Pay particular attention to the existing topography of the parking lot, which tends to impound water toward its center. All lands immediately surrounding the parking lot seem to drain toward it, therefore, by pass pumping should divert water well away from this area.
- B. Do not allow water to accumulate in excavations. De-watering operations shall be continuous throughout the excavation and subsequent fill operations. Remove water to prevent softening of foundation bottoms, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- C. Establish and maintain temporary drainage ditches, pipes, and other diversions to convey rain water and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- D. Dewatering of all excavations shall be included in scope of work. Employ the use of filtration measures as required by the soil conservation district to avoid discharging silt laden material into receiving storm sewers and waterways.
- E. Refer to the Soil Erosion & Sediment Control Plan for specific sediment filtering measures to be employed. This is especially important when pumping out the existing drywells as part of their rehabilitation.

3.4 MATERIAL STORAGE

- A. Stockpile excavated materials to be re-used until required. Place, grade and shape stockpiles for proper drainage within the limits of silt fence sediment barrier.
- B. Locate soil storage away from edge of excavations. Do not store within drip line of trees required to remain. Do not store where erosion could result in siltation of excavations, drainage systems, or off-site areas.
- C. Establish and identify separate stockpiles for:
 1. Soils suitable for re-use applications.
 2. Unsuitable soils for re-use in landscape areas only.
 3. Unsuitable soils to be hauled off site.

- D. Promptly remove from the site all materials not accepted for re-use.
- E. If severe weather is forecast, which could result in site flooding, the contractor shall remove from the adjacent storm water management basin, all fill piles, surface debris, and other materials that could become damaged or become buoyant during flooding conditions. All materials shall be stored in areas of higher elevation and not in ditches, swales, or storm water management facilities.

3.5 FILL AND BACKFILL

- A. Verify that all unsuitable fill material (estimated as being approximately 4 feet deep) has been excavated and subgrades comply with specified characteristics, including composition, elevation, thickness, and compaction.
- B. Place all controlled fill material in layers 8-12 inches thick and compacted until required subgrade elevations are reached, for each area classification.
- C. Backfill excavations as promptly as work permits, but not until completion of the following:
 - 1. Acceptance of construction below finish grade including, where applicable, damp-proofing, waterproofing, and perimeter insulation.
 - 2. Removal of trash and debris.
- D. Ground Surface Preparation:
 - 1. Remove vegetation, debris, unsuitable materials, obstructions, and deleterious materials from ground surface prior to placement of topsoil. Plow strips, or break-up, sloped surfaces steeper than 1 vertical to 4 horizontal so that topsoil material will bond with existing surface.

3.6 COMPACTION

- A. Moisture Control:
 - 1. Control moisture content of material which shall be compacted to permit compaction at a moisture content within +/- 3 percent of the applicable optimum moisture content.
 - 2. If material becomes too wet for the required compaction, dry material before starting or continuing compaction operations.
 - 3. If material becomes too dry for the required compaction, moisten material before starting or continuing compaction operations.
- B. Verify degree of compaction of subgrade and each lift. Do not place successive lift until previous lift is inspected and verified. Top of completed compacted fill shall be subject to final inspection and verification.

C. Procedures:

1. Following the removal of topsoil, root mats, tress, foliage, paving, other site features and the 4 foot +/- thick layer of soft fill material placed controlled compacted fill as described above in lifts of 8-12 inches (6-8 inches in confined areas), compacting each lift to 95% of maximum dry density per ASTM D-1557 method. Structural areas include those within future paved areas. Make additional passes and variation in layer thickness if necessary to obtain specified compaction. Each successive pass shall overlap the preceding adjacent pass by 10 percent. Roller passes made on material in unsuitable condition shall not be recognized in judging compliance.
2. Use hand-held compacting equipment in areas not otherwise accessible and reduce the backfill lift thickness to 6 to 8 inches.
3. Any loose or unstable areas encountered during proof rolling should be re-compacted in place or if specified compaction is unachievable, the soil shall be removed, and replaced with compacted dry structural fill as defined herein. All structural fill shall be placed at the optimum moisture content of +/-3%, per ASTM D1557 and compacted to 95% maximum dry density.

3.7 GRADING

- A. General: Uniformly grade areas within limits of grading, including transition to adjacent existing grades. Smooth finished surfaces within specified tolerances, with uniform levels or slopes between indicated elevation points and between such points and existing grades.
- B. Finish surfaces free from irregular surface changes to grades indicated on the Site Grading Plan, and within the following tolerances of required subgrade elevations (**Note: plan grades are to final surface**):
 1. Unpaved Lawn Areas:
 - a. Areas to receive topsoil: plus or minus 1 inch.
 - b. Areas not to receive topsoil: plus or minus 3/4 inch.
 2. Adjacent to walks and Pavements: plus or minus 1/4 inch. Shape surface of areas under walks and pavements to line, grade and cross-section. Final topsoil elevation adjoining walkways and pavements should be flush with or not more than 1/4 inch lower than the hard surface edge.
- C. The final graded surface shall be combed clean and free of debris, sticks, rocks, or foreign matter. The Engineer will inspect the final grade and require restoration of any areas deemed to be unsatisfactory.
- D. Areas adjacent to walkways MUST be graded to provide a smooth transition. No abrupt drop-off or "ankle twisters" will be tolerated. These areas will be inspected by the Engineer for compliance.
- E. General site grading and slope requirements are provided on the drawings. If no proposed grading values are shown then restore surfaces to original condition and elevation.

3.8 DRAINAGE FILL COURSE

- A. Place minimum 4" thick processed stone under all slabs on grade, under all concrete paving, sidewalks and elsewhere as indicated.
- B. Place drainage fill material on controlled compacted fill subgrade in layers of uniform thickness, to indicated cross-section and thickness, or if not otherwise indicated, a minimum of 4 inches thick. Maintain optimum moisture content for compacting. Test compaction before constructing other improvements. Furnish test results to the engineer.
- C. Place material in a single layer, except when more than 6 inches thick, place in equal layers, each layer not more than 6 inches or less than 3 inches thick when compacted.

3.9 FIELD QUALITY CONTROL

- A. Earthwork Testing & Inspection During Construction:
 - 1. The owner reserves the right to engage their own Geotechnical Engineering and testing services for this project and that shall be in addition to the contractor's requirement.
 - 2. The contractor shall provide geotechnical engineering services and soil compaction testing during construction. The testing shall be performed under the supervision of a licensed geotechnical engineer who shall certify the degree of soil and subbase compaction. ***Certification by a testing laboratory without professional geotechnical engineering certification is not acceptable, and will be rejected.***
 - 3. The following is intentionally repeated from a prior section. **Certification by a testing laboratory without professional geotechnical engineering certification is not acceptable, and will be rejected.**
 - 4. All soil compaction reports, demonstrating that required subgrade soil densities have been achieved, MUST be submitted to the Architect and Engineer at least 2 days prior to paving. Failure to do so may be grounds for rejecting subsequent pavement construction and the Contractor may be required to demolish and reconstruct all pavement atop subgrades that have not passed soil compaction testing.

3.10 MAINTENANCE

- A. Protect newly graded areas from traffic and erosion.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Recondition completed compacted areas which are disturbed by subsequent construction operations or adverse weather. Scarify surface, re-shape, and compact to required density.
- D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration.

3.11 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove excavated material classified as Unsuitable, except for unsuitable materials accepted for specific re-use, and dispose of same off-site in a legal manner.
 - 1. Comply with governing regulations for disposal of chemically contaminated materials.
- B. Excess Suitable and Accepted Unsuitable Excavated Material:
 - 1. Transport to area on site as indicated, or if not indicated, as directed, and pile or spread as indicated or as directed.
 - 2. Pile or spread to minimize erosion. Stabilize surface to minimize erosion as indicated, or if not indicated, stabilize by planting indigenous grass.
 - 3. Grass or other plant materials used only to stabilize excess earth storage must germinate and mature, but are exempt from other warranty or maintenance requirements.

END OF SECTION 02200

SECTION 02514 - PORTLAND CEMENT CONCRETE PAVING AND CURBS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.2 SECTION INCLUDES

- A. Provide cast-in-place Portland cement concrete paving required, including curbs, gutters, aprons, walkways, slabs, and other concrete pavements.
- B. Contractor to establish lines and grades for construction stakeout by engaging the services of a licensed land surveyor or professional engineer in the State of New Jersey.
- C. Special provisions for handicapped ramps (depressed curb requirements).

1.3 RELATED SECTIONS

- A. Section 02200: Prepared subgrade is specified in "Earthwork - Site" section.
- B. Section 02071: Removal of existing pavement, concrete, curbs, and other obstructions is noted in this section.
- C. Section 02100: Traffic control
- D. Section 03300: Cast-in-Place Concrete

1.4 REFERENCED STANDARDS

- A. ASTM American Society for Testing and Materials:
 - 1. A185.
 - 2. A615.
 - 3. A184.
 - 4. A307.
 - 5. A309.
 - 6. D-4632
- B. AASHTO American Association of State Highway and Transportation Officials:
 - 1. M233.
- C. ACI American Concrete Institute, Design of Concrete Mixes.

1.5 SUBMITTALS

- A. Provide Data: Furnish samples, manufacturer's product data, test reports, and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.

1.6 QUALITY ASSURANCE

- A. Codes and Standards: Comply with local governing regulations if more stringent than specified.
- B. Provide concrete batch plant tickets with quantities and mix proportions clearly indicated.
- C. Contractor to establish lines and grades for construction stakeout by engaging the services of a licensed land surveyor or professional engineer in the State of New Jersey.
 - 1. Detailed spot elevations are shown on the Site Grading Plan. Each elevation has been calculated to insure positive overland drainage and ADA compliance. Forms set for concrete shall be checked by the contractor's land surveyor at appropriate intervals to insure that plan grades are met.
 - 2. Extreme care must be taken to insure pavement is placed in such a manner to insure positive overland drainage can occur.
 - 3. The contractor's surveyor shall take additional spot elevations along paving limits where new work adjoins existing work to verify that positive drainage can occur. Construction limits shall be adjusted accordingly to suit field conditions.
- D. The location and elevation of all curbing, sidewalks, ramps, and other paving shall be established by a land surveyor licensed in the State of New Jersey. Contractor shall guarantee the correct alignment and positioning of constructed improvements.
- E. The contractor shall remove and reconstruct all work found to be poorly constructed, poorly finished, deficient, mis-aligned, damaged, or otherwise vandalized as determined by the engineer without additional cost.
- F. The contractor shall coordinate and schedule the installation of curb and concrete walkways, pad, etc., with other trades and contractors to insure that newly constructed concrete is not damaged by activities of other trades. If necessary postpone specific concrete construction in some areas until other trades have completed their work and the risk of damage is minimal.

1.7 REGULATORY REQUIREMENTS

- A. Comply with applicable provisions of codes, standards and specifications referenced in this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 - 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
 - 2. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.
- B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A185.
 - 1. Furnish in flat sheets, not rolls, unless otherwise acceptable to the Engineer. Use wire mesh in all concrete slabs, aprons, and sidewalk subject to vehicle loading per the construction plans.
 - 2. Also use in all large expanses of concrete slabs, at doorways, gathering areas, etc.. Use of mesh in standard sidewalk is not required.
 - 3. Mesh shall be installed in concrete walkways above pipes that pass through or immediately beneath per plan details.

2.2 CONCRETE MIX, DESIGN AND TESTING

- A. Comply with requirements of Section 03300 for concrete mix design, sampling and testing, and quality control, and as specified.
- B. Design mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (super-plasticizer), air-entraining admixture and water to produce the following properties:
 - 1. Compressive Strength: 4000 psi, minimum at 28 days, unless otherwise indicated.
 - 2. Slump Range: maximum 6 inches for concrete containing HRWR admixture (super-plasticizer); 3 inches for other concrete.
 - 3. Air Content: Use air-entraining admixtures to provide 5 percent to 8 percent.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities and as noted in section 02100.
 - 1. Utilize flag men, police traffic officers, barricades, warning signs and warning lights as required.

3.2 SURFACE PREPARATION

- A. Install geotextile fabric below subbase stone course in all areas subject to vehicular loading. Note: Concrete thickness is also increased to 6 inches and welded wire reinforcement is added.
- B. Remove trash, debris, and loose material from compacted subbase surface immediately before placing concrete.
- C. Place drainage fill material layer and compact subbase before placing concrete.
- D. Removal all water from subgrades, allow to dry thoroughly, re-compact as needed before the placement of concrete.
- E. Saw-cut adjoining surfaces to provide a smooth transition with new construction.
- F. Subgrades shall be thoroughly compacted to insure maximum moisture-density criteria is established. See "A" above.
- G. Concrete shall not be placed in wet forms or on saturated surfaces.

3.3 FORM CONSTRUCTION

- A. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed form work for grade and alignment to following tolerances:
 - 1. Top of forms not more than 1/8 inch in 10 feet.
 - 2. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
- C. Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.

3.5 CONCRETE PLACEMENT

- A. General: Comply with requirements of Section 03300 for mixing and placing concrete, and as herein specified.
- B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required 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.

- C. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with 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 dislocation of reinforcing, dowels, and joint devices.
 - 1. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 2. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than ½-hour, place a construction joint.
- D. Do not place concrete if inclement weather or freezing conditions are expected within the following 24 hours.
- E. Depressed curbs used for handicapped ramps or for the evacuation of surface waters from pavement areas shall be flush with final pavement surfaces. The depressed curb shall be installed with a maximum 2% cross-slope as follows:
 - 1. The depressed curb used for surface water drainage shall be sloped 2% away from pavement surfaces to maintain positive drainage across the curb.
 - 2. The depressed curb used at handicapped ramps shall be sloped 2% toward pavement surfaces to prevent surface water from entering the handicapped ramp or ponding along the handicapped curb depression.

3.4 JOINTS

- A. General: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated. Also refer to Plans for joint locations and scoring.
 - 1. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
 - 2. Expansion joints shall be placed in such a manner to insure that slabs shall be allowed to expand in no less than 2 directions and slabs shall not exceed 8 feet in any single dimension.
- B. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning concrete into areas measuring 4'x4', 5'x5', 6'x6', or 8'x8' as required subject to A2 above. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
 - 1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
- C. Expansion Joints : Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.

1. Locate expansion joints at an interval of 2 times the pavement thickness in inches, expressed as feet per inch. For example for a 4" thick concrete pavement the joint shall be at an interval not exceeding 8 feet (4 inches x 2 ft/inch = 8 feet)
2. Extend joint fillers full-width and depth of joint, and not less than 1/4 inch or more than 1/2 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
3. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.
4. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
5. Slabs adjoining building walls shall be doweled into the wall to prevent differential settling. See plans for typical doweled connection to building walls.
6. Do not set controls joints in such a manner that would result in small irregular sections.

3.5 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10 feet straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2 inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 1. Broom finish, by drawing a fine-hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture as reviewed by Architect.
 2. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.
- E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by the Engineer.
- F. Install detectable warning strip on handicapped ramps per NJ DOT and ADA requirements.

3.6 CURING

- A. Protect and cure finished concrete paving. Use membrane- forming curing and sealing compound or Engineer's reviewed moist-curing methods. Keep concrete surfaces moist during curing period.

3.7 REPAIRS AND PROTECTIONS

- A. Repair or replace broken, stained, misaligned, defective, or vandalized concrete or curbing, as directed by Engineer at no additional cost to the owner.
- B. Drill test cores where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

END OF SECTION 02514

SECTION 02920 - SOIL PREPARATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.
- B. Restoration of lawn areas, lawn areas that have been re-graded, and other natural areas disturbed by construction.
- C. As a minimum all disturbed areas of a natural surface (i.e. not paved, stone covered, or otherwise covered with a synthetic coating) shall be restored as lawn per the plan.

1.2 WORK INCLUDED

- A. Topsoil.
- B. pH adjusters.
- C. Soil Conditioners.
- D. Fertilizer.

1.3 RELATED SECTIONS

- A. Section 02005 – Project Closeout - Site
- B. Section 02110 - Selective Site Demolition
- C. Section 02200 - Earthwork - Site
- D. Section 02930 - Lawns and Grasses.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's technical literature with installation and storage instructions for each product specified.
- B. Samples: If requested by Architect.
- C. Quality Control:
 - 1. Test Reports: Topsoil composition, in duplicate. Acid-producing deposits, in duplicate
 - 2. Certifications: In duplicate.

1.5 QUALITY ASSURANCE

- A. Reference Standards: Applicable requirements of standards and specifications referenced herein apply to the Work of this Section.
- B. Regulatory Agencies: Conform to applicable requirements of Local and State department of Architecture Extension service of the state in which the project is located.
- C. Contractor's certification that products installed conform with requirements specified.
- D. Pre-Installation Conference:
 - 1. Hold at time and place designated by Engineer, and attended by representative of Contractor, landscaping trades and other trades whose work affects landscaping before starting work.
 - 2. Discuss and finalize the following for record:
 - a. Review project drawings and specifications, including revisions, approved shop drawings and documented local landscaping practice; resolve conflicts, deviations or differences in local practice and project documents.
 - b. Review drawings for correct drainage, appropriate plants for locations shown, location and purity of water and verification of soil test results.
 - c. Time schedule and sequence of events proposed for installation.
 - d. Review limitations imposed by weather and special requirements of Contractor.
 - e. Establish storage and working areas of site available for use.
 - f. Clarify specifications, details, application/ installation, requirements what work should be completed before start of landscaping, and other items affecting installation and quality application of landscaping.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to job site in unopened containers bearing manufacturer's name and content identification.
- B. Store materials as recommended by the manufacturer.

1.7 PROJECT CONDITIONS

- A. Coordination: Coordinate this Work with the Work of other Sections to avoid any delay or interference with other Work.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. Existing Soil: Existing topsoil is limited and the contractor shall supplement with off-site topsoil meeting the criteria in these specifications. Modify existing topsoil to conform to composition requirements specified below and supplement as needed to provide minimum topsoil thicknesses suitable for new lawns and grasses.

B. Off-Site Topsoil:

1. Conform to composition requirements specified below. Topsoil must be certified clean per NJ DEP residential clean fill standards. Topsoil must be screened to remove all debris, trash, and inorganic material larger than ¾ of an inch measured in any direction.
2. Screened Topsoil: Furnished by Contractor

C. Composition:

1. Specific for lawns, grasses, trees, plants and ground covers specified and shown on the drawings.
2. Physical Analysis (Soil Texture):

| Quantity Percent by Oven Dry Weight | Size Fraction | Range of Particle Diameter (Inches) |
|-------------------------------------|---------------|-------------------------------------|
| Less than 1% | gravel | Larger than 3/4 |
| Less than 3% | gravel | 1/4 to 1 |
| Less than 10% | gravel | 2/25 to 1/4 |
| 40% to 65% | sand | 1/500 to 2/25 |
| 25% to 60% | silt | 1/12,500 to 1/500 |
| Less than 20% | clay | Smaller than 1/12,500 |

- a. Determine amounts of sand, soil and clay in the bail by hydrometer method or mechanical analysis. Size gravel by separation on screens with appropriate size openings.
 - b. Soil should be relatively free of un-decomposed roots, sticks, leaves, paper and other organic material. Remove undesirable trash such as glass, plastic or metal fragments before seeding or planting.
3. Chemical Analysis:
- a. Organic matter content (% oven dry weight of soil):
 - 1) Sandy loam 1.25% to 20%.
 - 2) Loam and silt loam 2.5% to 20%.
 - 3) Soil with less than 10% organic matter use wet oxidation method of analysis.
 - 4) Soil with more than 10% organic matter use loss on ignition method of analysis.
 - b. Soil reaction: pH of 4.5 to 7.0.
 - c. Soluble salt content:

- 1) Conductivity (Ece, millimhos per centimeter):
Less than 1.0 mmhos/cm for a 1:1 soil:water ratio.
Less than 0.5 mmhos/cm for a 1:2 soil:water ratio.
Less than 0.33 mmhos/cm for a 1:3 soil:water ratio.

2.2 PH ADJUSTERS

A. Lime:

1. Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates.
2. Gradation: Minimum 50 percent passing 100-mesh sieve and 90 percent passing 10-mesh sieve.

B. Aluminum Sulfate: Commercial grade.

2.3 SOIL CONDITIONERS

A. General:

1. Use singly or in combinations required to meet requirements for topsoil.
2. Soil Conditioners: Nontoxic to plants. Acid-neutralization as required.

B. Peat:

1. Peat humus derived from a freshwater site and conforming to ASTM D 2607 as modified herein.
2. Shred and granulate peat to pass ½-inch mesh screen and condition in storage pile for minimum six months after excavation.

C. Sand: Clean and free of toxic materials.

D. Perlite: Horticultural grade for planters.

E. Vermiculite: Horticultural grade for planters, free of toxic substances.

F. Rotted Manure:

1. Rotted horse or cattle manure containing maximum 25 percent by volume of straw, sawdust, or other bedding materials; free of stones, sticks and soil and containing no chemicals or ingredients harmful to plants.

2.4 FERTILIZER

A. Commercial Grade fertilizer:

1. Complete, neutral character, with elements derived from organic sources, containing the following percentages of available plant nutrients:

- a. Lawns: For each 100 square feet of area provide fertilizer with a minimum of 1 lb. actual nitrogen with a minimum of 50 percent in organic form, 4 percent phosphoric acid, and 2 percent potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth.
- b. Trees and Shrubs: Provide fertilizer with not less than 5 percent total nitrogen, 10 percent available phosphoric acid and 5 percent soluble potash.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas in which Work is to be performed. Report in writing to Architect and Engineer all prevailing conditions that will adversely affect satisfactory execution of Work. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Starting Work constitutes acceptance of the existing conditions and this Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective Work encountered.
- C. Examine existing topsoil found at the project site for suitable for re-use as specified herein. Determine if existing topsoil satisfies topsoil requirements as defined herein and/or if they can be modified to comply. Supplement with additional topsoil as needed to restore all disturbed areas to lawns and grasses as shown on the drawings.

3.2 PREPARATION

- A. Subgrade:
 - 1. After areas required to be restored have been brought to required subgrade, thoroughly till to minimum depth of 8 inches by scarifying, disking, harrowing, or other approved methods.
 - 2. Remove debris and stones larger than one inch in any dimension remaining on surface after tillage.

3.3 TOPSOILING

- A. Immediately prior to placing topsoil, prepare entire planting areas shown on drawings, scarify subgrade to a 8 inch depth for bonding of topsoil with subsoil.
- B. Lawns: Spread screened topsoil evenly to a minimum depth of 4 inches. Do not spread topsoil when frozen or excessively wet or dry.
- C. Correct irregularities in finished surfaces to eliminate depressions.
- D. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.4 pH ADJUSTERS, SOIL CONDITIONERS AND FERTILIZER

- A. Application: Apply fertilizer and soil conditioners in accordance with the Permanent Seeding Specification on the Soil Erosion and Sediment Control Plan.
- B. Adjust pH level in topsoil and subgrade soils as discussed in related earthwork sections. Dispose of acid soils off-site in a legal manner.

END OF SECTION 02920

SECTION 02930 – LAWNS & GRASSES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.
- B. Temporary and permanent stabilization, as specified in this section, shall be carried out as outlined on the Plan and in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey.

1.2 WORK INCLUDED

- A. Seed.
- B. Mulches.
- C. Asphalt Adhesive.
- D. Water.
- E. Soil Erosion Control Material.
- F. Subgrade Elevations: Excavation, filling and grading required to establish elevations shown on Drawings are not specified in this section.
- G. **The task items specified in A through D above must be applied to all disturbed areas, whether or not specifically indicated on the drawings. Include adjacent property wherever grass is disturbed in execution of this contract.**

1.3 RELATED SECTIONS

- A. Section 02200 - Earthwork-Site
- B. Section 02920 - Soil Preparation.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's grass seed technical literature with installation and storage instructions for each product specified, including warranties.
- B. Delivery Schedule: Seed must be delivered to the site ten working days prior to installation.

D. Quality Control:

1. Certifications: In duplicate.
2. Certificates of inspection required by regulatory agencies. Data substantiating that materials comply with requirements specified.
3. Seed supplier's certification for each grass seed species mixture specified, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed.

E. Contract Closeout:

1. Maintenance schedule: In duplicate.

1.5 QUALITY ASSURANCE

A. Reference Standards: Applicable requirements of standards and specifications referenced herein apply to the Work of this Section.

B. Regulatory Agencies: Cape Atlantic Soil Conservation District. Note that the area of disturbance is less than 5,000 square feet, therefore, notification to the local soil conservation district is not required.

C. Shipping: Ship landscape materials with certificates of inspection required by regulatory agencies. Comply with regulations applicable to landscape materials.

D. Non-availability: If specified landscape material is not obtainable, submit proof of non-availability to Architect, together with proposal for use of equivalent material.

E. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

F. Pre-Installation Conference:

1. Hold at time and place designated by Architect and attended by representatives of Owner, Contractor, landscaping trades and other trades whose work affects landscaping before starting work.
2. Discuss and finalize the following for record:
 - a. Review project Drawings and specifications, including revisions, approved shop Drawings and documented local landscaping practice; resolve conflicts, deviations or differences in local practice and project documents.
 - b. Review drawings for correct drainage, appropriate plants for locations shown, location and purity of water and verification of soil test results.
 - c. Time schedule and sequence of events proposed for installation.
 - d. Review limitations imposed by weather and special requirements of Contractor.
 - e. Establish storage and working areas of site available for use.
 - f. Clarify specifications, details, applications/installation requirements, what work should be completed before start of landscaping, and other items affecting installation and quality application of landscaping.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in unopened water tight containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site as recommended by manufacturer.

1.7 PROJECT CONDITIONS

- A. Coordination: Coordinate this Work with the Work of other Sections to avoid any delay or interference with other Work.
- B. Proceed with and complete work of this section as rapidly as portions of site become available, working within planting date limitations for work specified.
- C. Correlate planting with specified maintenance periods to provide maintenance from date of Substantial Completion.

1.8 WARRANTY

- A. Warranty lawns and grasses unconditionally for one full growing season beginning from date of final acceptance.
- B. Beginning from the date of final acceptance, all lawns and grasses shall be alive and in satisfactory growth at end of warranty period.
- C. Replace any material that is diseased or 25% dead or more at no cost to the Owner.

1.9 MAINTENANCE

- A. Provide typewritten or printed maintenance instructions for one full growing cycle.
- B. Maintenance Instructions Include:
 - 1. Rate and frequency of irrigation.
 - 2. Pesticide, fertilizer and herbicide application schedules.
 - 3. Optimum mowing height.

PART 2 - PRODUCTS

2.1 SEED

A. Classification & mixture:

1. Lawn seeding: Fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide permanent seed mixture composed of grass species, proportions and minimum percentages of purity, germination, fertilizer, and maximum percentage of weed seed, specified on the Soil Erosion & Sediment Control plan. If seed mixture is not specified on the plan, then provide a 50/50 blend of Kentucky Bluegrass and Tall Fescue.
2. Follow allowable and optimal seeding dates shown on Soil Erosion & Sediment Control Plan.
3. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.
4. Label containers carrying seed in conformance with state seed laws. Maintain segregation.

B. Soil Preparation: After final grading, collect random soil samples at least 2 weeks before planned seeding & have soil tested in a certified soils laboratory. Obtain report from laboratory on treating/correcting soil deficiencies prior to seeding and adhere to laboratory report recommendations.

2.4 MULCHES

A. General: Free from noxious weeds, mold, and other deleterious materials.

B. Threshed Straw: Seed free threshed straw stalks from oats, wheat, rye or barley. Air-dry condition of proper consistency for placing with commercial mulch blowing equipment.

C. Salt hay: Use only seed free salt hay for lawn areas. Air-dry condition of proper consistency for placing with commercial mulch blowing equipment.

D. Landscaping mulch shall be new hardwood mulch, color and consistency to match existing mulch in nearby landscaping beds.

2.5 ASPHALT ADHESIVE

A. ASTM D977, Grade rS-1. Use with straw or salt hay mulch.

2.6 WATER

A. Suitable quality and quantity for irrigation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas in which Work is to be performed. Report in writing to Architect all prevailing conditions that will adversely affect satisfactory execution of Work. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Starting Work constitutes acceptance of the existing conditions and Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective Work encountered.
- C. After final grading of topsoil, collect random samples not less than 2 weeks in advance of planned seeding. Obtain test reports and follow lab recommendations on treating/correcting soil deficiencies to insure optimum germination.

3.2 PLANTING CONDITIONS AND TIME RESTRICTIONS

- A. Planting Dates: Follow allowable and/or optimal planting dates shown on Soil Erosion and Sediment Control Plan. Unseasonable weather variations may permit seeding beyond the specified dates, which shall be at the contractor's sole risk.
- B. Restrictions: Do not plant beyond the specified dates, or when ground is frozen, snow covered, oversaturated, poorly graded, rutted, or when the topsoil has not been tested and prepared.

3.3 PREPARATION FOR PLANTING LAWNS

- A. Loosen subgrade of lawn areas to a minimum depth of 4 inches. Remove stones over 3/4 inch in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which can be plated promptly after preparation.
- B. Place approximately ½ of total amount of top soil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil to meet lines, grades and elevations shown. Add soil amendments as specified by the soils testing lab and mix thoroughly into upper 4 inches of topsoil and lightly fine grade all areas to provide the indicated grades and elevations after natural settlement occurs.
- C. Provide Lime and Fertilizer as specified on the Soil Erosion and Sediment Control Plan, unless directed otherwise by the soils testing laboratory.
- D. Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Do not use compaction equipment on lawn areas. Limit fine grading to areas which can be planted immediately after grading. Leave top 4 inches of soil scarified by using an agricultural-style cultivator immediately prior to seeding.
- E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before plating lawns. Do not create a muddy soil condition.

- F. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

3.4 SEEDING

- A. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hr. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
- B. Sowing Rate: per plans and details.
- C. Rake seed lighting into top 1/8 inch of soil, roll lightly, and water with a fine spray.
- D. Protect seeded slopes against erosion with erosion control material.
- E. Protect seeded areas against erosion with mulch after completion of seeding operations. Spread mulch uniformly to form a continuous blanket not less than 1-1/2 inches loose measurement over seeded areas.
 - 1. Anchor mulch by crimping with serrated disc, or by spraying with asphalt emulsion at the rate shown on the Soil Erosion and Sediment Control Plan. Take precautions to prevent damage or staining of structures, pavements, utilities or other plantings adjacent to mulched areas.
- F. Rolling:
 - 1. Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width.
 - 2. If seeding is performed with cultipacker-type seeder or Hydro seeding, rolling may be eliminated.
- G. Watering: Start immediately after completing each day's seeding. Apply at a rate sufficient to ensure thorough wetting of soil to minimum depth of 4 inches.

3.5 PROTECTION OF LAWN AND GRASS AREAS

- A. Immediately after seeding, protect the area against traffic or other use. Install bright orange snow fence around all newly seeded lawn areas.

3.6 RESTORATION

- A. Recondition existing lawn areas damaged by Contractor's operations including storage of materials and equipment, movement of vehicles, or where minor regrading is required.
 - 1. Provide fertilizer soil amendments and seed or sod specified for new lawns and grasses as required to provide a satisfactorily reconditioned lawn. Provide new topsoil to fill low spots and meet new finish grades.
 - 2. Cultivate bare and compacted areas thoroughly to provide a satisfactory, planting bed.

3. Remove diseased and unsatisfactory lawn areas; do not bury in cultivated soil. Remove topsoil containing foreign materials resulting from Contractor's operations including oil dripping, stone, gravel and other building materials.
 4. Where substantial lawn remains:
 - a. Remove weeds before seeding, if extensive, apply EPA approved selective chemical weed killer.
 - b. Compacted, fill low spots, remove humps and cultivate soil, fertilize, and seed.
 - c. Apply a seedbed mulch, if required, to maintain moist condition.
- B. Water newly planted areas and keep moist with daily watering schedule until new grass is established.

3.7 ESTABLISHMENT PERIOD

A. Definitions:

1. Lawns and grasses establishment period will be in effect until lawns and grasses have been mowed three times, and
2. Stand of lawn and grass is 95 percent ground cover of established species.

B. Maintenance During Establishment Period:

1. Begin maintenance immediately after planting.
2. Maintain lawns for not less than the following periods, and longer as required to establish an acceptable lawn.
 - a. Seeded lawns: Not less than 60 days after Substantial Completion.
 - b. If seeded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.
3. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth lawn acceptable to the Architect, free of eroded or bare areas.
4. Mow lawns and grassed areas to an average height of 2 inches whenever average height of grass becomes 3 inches.
5. Promotion of Growth: Mow, remove excess clippings, eradicate weeds, water, fertilize, overseed, and perform other operations necessary to promote growth.
6. Post-fertilize areas with commercial grade fertilizer approximately 7 days after planting and at intervals of 2 weeks thereafter until accepted. Apply fertilizer uniformly as specified in the Plan.

3.8 CLEANUP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Protect landscape materials, and work from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed by the Architect.

3.9 FINAL ACCEPTANCE

A. Final Inspection and Acceptance:

1. Final inspection will be made upon written request from the Contractor at least 10 days prior to last day of lawn and grasses establishment period.
2. Final acceptance will be based upon a satisfactory stand of lawns and grasses as defined in the paragraph entitled, "Establishment Period."

B. When inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected and accepted by the Engineer or Architect. Contractor shall remove rejected plants and materials promptly from project site.

C. Replanting: Replant areas which do not have a satisfactory stand of lawns and grasses.

END OF SECTION 02930

SECTION 03300 - CONCRETE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

- A. Extent of concrete work is shown on the drawings.
- B. Concrete footings.
- C. Concrete paving, walks and ramps are specified in Division 2.

1.3 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds and others as required by Architect.
- B. Samples: Submit samples of materials as requested by Architect, including names, sources and descriptions.
- C. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test.
- D. Materials Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Architect. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.
- E. Shop Drawings: Reinforcement: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing diagrams of bent bars, arrangement of concrete reinforcement.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

ASTM C94/C94M "Specification for Ready-Mixed Concrete"

ACI 117 "Tolerances for Concrete Construction and Materials"

ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete"

| | |
|--------------|--|
| ACI 301/301M | "Structural Concrete for Buildings." |
| ACI 302.1R | "Guide for Concrete Floor and Slab Construction" |
| ACI 304R-00 | "Guide for Measuring, Mixing, Transporting and Placing Concrete" |
| ACI 305R | "Hot Weather Concreting" |
| ACI 306R | "Cold Weather Concreting" |
| ACI 308.1 | "Standard Specification for Curing Concrete" |
| ACI 311.1R | "ACI Manual of Concrete Inspection (SP-2)" |
| ACI 311.4R | "Guide for Concrete Inspection" |
| ACI 318 | "Building Code Requirements for Reinforced Concrete", except as modified in accordance with International Building Code. |
| ACI 347R | "Guide to Formwork for Concrete" |

Concrete Reinforcing Steel Institute, "Manual of Standard Practice."

- B. Concrete Testing Service: The Contractor shall engage a testing laboratory acceptable to Architect to perform material evaluation tests and to design concrete mixes.
- C. Materials and installed work may require testing and retesting at anytime during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.
- D. Installation of Vapor Barrier: Installation shall be in accordance with manufacturer's direction and in compliance with ASTM E 1745 "Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs".

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Welded Deformed Steel Wire Fabric: ASTM A 497.
- E. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II.
 - 1. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
- B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.
- C. Water: Drinkable.
- D. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Air-Mix"; Euclid Chemical Co.
 - b. "Sika Aer"; Sika Corp.
 - c. "MB-VR or MB-AE"; Master Builders.
 - d. "Darex AEA" or "Daravair"; W.R. Grace.
 - e. Or approved equal
- E. Water-Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.05 percent chloride ions.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "WRDA" Hycol"; W.R. Grace.
 - b. "Eucon WR-75" or "Eucon WR-89"; Euclid Chemical Co.
 - c. "Pozzolith 322N"; Master Builders.
 - d. "Plastocrete"; Sika Corp.
 - e. Or approved equal
- F. High-Range Water-Reducing Admixture (Super Plasticizer) ASTM C 494, Type F or Type G and containing not more than 0.05 percent chloride ions.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Daracem 100" or "WRDA-19"; W.R. Grace.
 - b. "Eucon 37"; Euclid Chemical Co.
 - c. "Rheobuild 1000"; Master Builders.
 - d. "Sika 686"; Sika Corporation.
 - e. Or approved equal
- G. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.024 percent chloride ions.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Accelguard 80"; Euclid Chemical Co.
 - b. "Daraset"; W.R. Grace
 - c. Or approved equal
- H. Water-Reducing, Retarding Admixture: ASTM C 494, Type D and containing not more than 0.05 percent chloride ions.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Pozzolith Retarder"; Master Builders.
 - b. "Eucon Retarder 75"; Euclid Chemical Co.
 - c. "Daratard 17"; W.R. Grace.
 - d. "Plastocrete 161R"; Sika Corporation.
 - e. Or approved equal
- I. Prohibited Admixtures: Calcium chloride thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.

2.4 RELATED MATERIALS

- A. Extruded Polystyrene Board Insulation: Rigid closed-cell extruded, expanded polystyrene insulation board with integral high-density skin, complying with FS HH-I-524 Type IV: min. 20 psi compressive strength, k value of 0.20: 0.30% maximum water absorption: 1.1 perm/inch max water vapor transmission: manufacturer's standard length and widths.
- 1. Manufacturer: Subject to compliance with requirements, provide products of one of the following or an approved equal:
 - a. Dow Chemical Co: Midland MI
 - b. VC Industries/V.5 Gypsum: Chicago, IL
 - c. Or approved equal.
- B. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.
- 1. Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. Non-metallic:
 - 1) "Masterflow 713"; Master Builders
 - 2) "Euco-NS"; Euclid Chemical Co.
 - 3) "Five Star Grout"; U.S. Grout Corporation.
 - 4) Or approved equal.

- C. Absorptive Cover: Burlap cloth made from jute or kenaf weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Waterproof paper.
 2. Polyethylene film.
 3. Polyethylene-coated burlap.
- E. Clear curing and sealing compound (VOC Compliant): The compound shall have 30% solids content minimum, and will not yellow under ultra violet light after 500 hours of test in accordance with ASTM D 4887 and will have test data from an independent testing laboratory indicating a maximum moisture loss of 0.039 grams per sq. cm. when applied at a rate of 300 sq. ft. per gallon. Sodium silicate compounds are not permitted.
1. Product: "Super Diamond Clear Vox" by Euclid Chemical Co.; or approved equal.
- F. Vapor Barrier: Provide vapor barrier cover over prepared base material where indicated. Use only materials which are resistant to decay when tested in accordance with the following:
1. Thickness: 15 mils.
 2. Permeance: ASTM E 96; .01 perms before and after conditioning and in accordance with ASTM E 1745 Class A requirements and ATM E 154 for mandatory conditioning tests.
 3. Puncture Resistance: ASTM D 1709; 2200 grams.
 4. Chemical Resistance: ASTM E 154, unaffected.
 5. Life Expectancy: ASTM E 154, indefinite.
 6. Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. "Wrap 15-mil " Vapor Barrier; Stego Industries, LLC.
 - b. "VaporFLEX" by Layfield.
 - c. "Moistop Ultra 15-mil" by Fortifiber.
 - d. "Griffolyn G15" by Reef.
 - e. Or approved equal.
 7. Accessories: Seam tape; ASTM E 96 , 0.3 perms or lower.
 8. Vapor barrier sheets with seams overlapped not less than 12".
 9. **All penetrations must be sealed using a combination of the manufacturer's tape and/or mastic.**
 10. Installation shall be in accordance with manufacturer's direction and in compliance with ASTM E 1643-98 "Standard Practice for Installation of Water Vapor Retarders Used in

Contact with Earth or Granular Fill Under Concrete Slabs". Include manufacturer's recommended adhesive or pressure-sensitive tape.

- G. Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings:
 - 1. 3500 psi 28-day compressive strength; W/C ratio, 0.47 maximum.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be admitted to and accepted by Architect before using in work.
- E. Admixtures:
 - 1. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in concrete as required for placement and workability.
 - 2. Use high-range water-reducing admixture in pumped concrete, concrete for industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight and concrete with water/cement ratios below 0.50.
 - 3. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
 - 4. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits.
 - a. 5% for maximum 2" aggregate
 - b. 6% for maximum 3/4" aggregate
 - c. 7% for maximum 1/2" aggregate
- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs and sloping surfaces: Not more than 3".
2. Reinforced foundation systems: Not less than 1" and not more than 3".
3. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.
4. Other concrete: Not less than 1" nor more than 4"

2.6 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
- B. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 - EXECUTION

3.1 FORMS

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structure are of correct size, shape, alignment, elevations and position.
- B. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keywarp, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features, required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

3.2 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
 1. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations.
- B. Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during

concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.3 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate at a maximum spacing of 90 feet, so as not to impair strength and appearance of the structure, as acceptable to Architect.
- B. Control Joints: Locate and install control joints as indicated or at a maximum spacing of 30 feet. Locate at a spacing which does not impair appearance of the structure as acceptable to Architect.
- C. Joint filler and sealant materials are specified in Section 07900.

3.4 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms, or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
- C. Installation of Vapor Barrier: Install materials in accordance with manufacturer's direction and in compliance with ASTM 1643-98 "Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs".
 - 1. Seal all slab penetrations with manufacturer's approved or recommended tapes, sealants, adhesives, and other materials to achieve indicated testing requirements.
 - 2. Protect vapor barrier materials during construction operation, repair or replace damaged material with new materials.

3.5 CONCRETE PLACEMENT

- A. Pre-placement inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
 - 1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.

- B. General: Comply with ACI 304R-00 "Guide for Measuring, Mixing, Transporting and Placing Concrete", and as herein specified.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
- E. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- F. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
- G. Maintain reinforcing in proper position during concrete placement operations.
- H. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which would be caused by frost, freezing actions or low temperatures, in compliance with ACI 306R.
- I. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- J. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305R.

3.6 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.
- B. After screeding, consolidating and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances as follows:
 1. Ff 12 - Fl 9 For noncritical areas: mechanical rooms and surfaces to have thick-set tile.
 2. Ff 15 - Fl 12 For carpeted areas
 3. Ff 21 - Fl 15 For thin-set flooring
 4. Ff 27 - Fl 21 For warehouse, gymnasiums.
 5. Ff 30 - Fl 30 For TV studios

Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.
- D. After floating, begin first trowel finish operation using a power driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances as follows:
 - 1. Ff 20 - Fl 15 For noncritical areas: mechanical rooms and surfaces to have thick-set tile.
 - 2. Ff 25 - Fl 20 For carpeted areas
 - 3. Ff 35 - Fl 25 For thin-set flooring
 - 4. Ff 45 - Fl 35 For warehouse, gymnasiums.
 - 5. Ff 50 - Fl 50 For TV studios

Grind smooth surface defects which would telegraph through supplied floor covering system.

- E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps and elsewhere as indicated.

3.7 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 308 (latest edition) procedures. Avoid rapid drying at end of final curing period.
- D. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing and by combinations thereof, as herein specified.
- E. Provide moisture curing by following methods.
 - 1. Keep concrete surface continuously wet by covering with water.
 - 2. Continuous water-fog spray.
 - 3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 12" lap over adjacent absorptive covers.

- F. Provide moisture-cover curing as follows:
 - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, place in widest practicable width with sides and ends lapped at least 12" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- G. **Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as glue-down carpet), painting and other coatings and finish materials, unless otherwise acceptable to Architect.**
- H. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
- I. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture retaining cover, unless otherwise directed.

3.8 MISCELLANEOUS CONCRETE ITEMS

- A. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- B. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

3.9 CONCRETE SURFACE REPAIRS

- A. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
- B. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable conditions.
- C. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
- D. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
- E. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material.

3.10 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. The Contractor will employ and pay for a testing laboratory to perform the following tests, inspect formwork and reinforcement placement and to submit test reports. Testing laboratory must be pre-approved by the Architect.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
- C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - 1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - 2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
- D. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
- E. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
- F. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
- G. Test results will be reported in writing to Architect, Structural Engineer and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
- H. Nondestructive Testing: Impact hammer, sonoscope or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- I. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

END OF SECTION 03300

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SECTION 03450 - SELF-DRYING FINISHING UNDERLAYMENT

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. Section Includes:
 - 1. Extent of Self Drying Cement - Based Finishing Underlayment for flooring work as indicated on the drawings.
- B. Related Sections:
 - 1. Section 09650 - Resilient Flooring
 - 2. Section 09682 - Carpet Entry Mats
 - 3. Section 09685 - Carpet Tile

1.3 DEFINITIONS

- A. Self-Drying Finishing Underlayment for flooring includes systems which consist of materials specially formulated, portland cement self-smoothing, rapid hardening compound to level and repair existing interior concrete slabs.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations for each major product required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- B. Test Reports: Submit results of testing specified.
 - 1. Certificates: Submit manufacturer's test data certifying compliance with specified performance requirements.
 - 2. Test reports: Submit test data for moisture content and hydrostatic pressure of existing concrete slab.
- C. Certificates: Submit manufacturer's certification that products comply with requirements of the contract documents.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain required products from a single manufacturer.
- B. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for a recommended 5 years.

- C. Installer's Qualifications: All work of this section shall be performed by an experienced applicators, licensed by the manufacturer of the system and successfully completed this type of work for a recommended 2 years.
- D. Codes and Standards: Comply with requirements of the contract documents or of governing codes and authorities having jurisdiction.
- E. Mock-up: Prior to installation of work of this section, erect sample at location directed by or acceptable to the Architect, using specified materials and workmanship to be expected in the completed work. Once mock-up has been approved by the Architect, retain until the work has been completed and accepted.
 - 1. Configuration: Approximately 4 feet by 4 feet.
 - 2. Mock-up may not be incorporated into the final work; demolish and remove from site when directed by the Architect.
- F. Pre-installation Conference: Prior to installation of work of this section, conduct a meeting at the project site to discuss quality assurance requirements. In addition to the contractor and the installer, arrange for attendance of the following:
 - 1. Other installers affected by the work of this section.
 - 2. The Owner's Representative.
 - 3. The Architect.
 - 4. Manufacturer's Representative.
 - 5. Supplier.
- G. Allowable Tolerances:
 - 1. Variation from Level: Do not exceed 1/4 inch in any bay or 10 feet in distance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials dry at all times. Protect against exposure to weather and against contact with damp or wet surfaces.
- B. Store materials on one site to maintain proper separation and grading integrity. Cover materials to prevent excessive accumulation of moisture.
- C. Protect materials from excessive moisture in shipment, storage, and handling. Deliver materials in manufacturer's unopened packages, and store in dry place with adequate air circulation.
- D. Storage: Stack products of this section carefully to provide air circulation within stacks.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements: Do not proceed with installation when air temperatures are below 40°F, or above 95°F, unless protective measures acceptable to the manufacturer are taken.

- B. Do not proceed with installation until temperature and relative humidity have been stabilized and will be maintained within values established by the manufacturer for optimum quality control.
- C. Provide adequate ventilation to prevent accumulation of hazardous fumes during application of components in enclosed spaces, and maintain ventilation until materials have thoroughly cured.

1.8 SEQUENCING AND SCHEDULING

- A. Coordinate work of this section with other trades and installation of special construction and equipment.

1.9 WARRANTY

- A. Special Project Warranty: Submit a written warranty signed by the manufacturer, the contractor, and the installer, guaranteeing to correct failures in materials and workmanship which occur within the warranty period, including those attributable to abnormal aging, without reducing or otherwise limiting any other rights to correction which the Owner may have under the contract documents.
 - 1. The warranty shall include responsibility for removing and replacing other work as necessary to accomplish repairs or replacement of materials covered by the warranty
 - a. Warranty period: Minimum **two (2) years** after date of substantial completion.

PART 2 - PRODUCTS

2.1 MIXES

- A. Basis of Design: "Ardex Feather Finish" Self-Drying, Cement -Based Finishing Underlayment, as manufactured by ARDEX Engineered Cements, Aliquippa, PA, Tel.# 888.512.7339, www.ardex.com; or approved equal.
- B. Subject to compliance with requirements of the Contract Documents, manufacturers offering products which may be incorporated in work include the following:
 - 1. Mapei, South River, NJ, Tel.# 732.254.8001.
 - 2. CMP Specialty Products, Horsham, PA, Tel.# 215.672.6384.
 - 3. Or approved equal.
- C. Follow the manufacturer's printed instructions, procedures and recommended equipment for mixing the components.
 - 1. Mixing Ratio: 2½ quarts of water per 10 lbs. bag at 70°F.
 - a. For smaller batches, use 2 parts powder to 1 part water by volume.
- D. Compressive Strength: ASTM C 109, 4200 psi, minimum.
- E. VOC: 0

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect substrates and conditions under which the work of this section will be performed, and verify that installation properly may commence. Do not proceed with the work until unsatisfactory conditions have been resolved fully.
 - 1. Commencement of work shall constitute acceptance of conditions. Any necessary remedial work required to correct any unsatisfactory conditions, found after the start of installation, will be provided at no cost to the Owner.
 - 2. If asbestos abatement of flooring products was performed (by others), review product information on the product(s) used (by others) to remove the adhesive(s) to ensure compatibility.
- B. Testing: Perform required testing of existing concrete slab, for hydrostatic pressure and moisture content. Follow manufacturer's recommended procedures for testing slab. Do not proceed with the work until unsatisfactory conditions have been resolved fully.

3.2 PREPARATION

- A. Clean substrate, removing projections, all loose material and substances detrimental to the work; comply with recommendations of manufacturer of products to be installed for proper preparation procedures.
- B. Prepare substrate in accordance with recommendations of manufacturer for optimum installed performance.
- C. Mask off or otherwise protect adjacent surfaces not scheduled to receive products of this section.
- D. Coordinate installation with other trades, report conditions in writing to the Owner/Architect. Do not proceed with application work until any unsatisfactory conditions have been corrected.

3.3 APPLICATION

- A. General: Comply with manufacturer's instructions, except where more stringent requirements are shown or specified, and except where project conditions require extra precautions or provisions to ensure satisfactory performance of the work.
 - 1. Apply materials to the substrate with flat side of a steel trowel to obtain a solid mechanical bond. Apply sufficient pressure to fill all defects and to feather the product into the subfloor surface and to suit existing substrate conditions.

3.4 CLEANING

- A. Upon completion, clean all surfaces which have become soiled or coated as a result of work of this section, using proper methods which will not scratch or otherwise damage finished surfaces.

- B. For cleaning, use only products and techniques acceptable to manufacturer of products being cleaned.

3.5 PROTECTION

- A. General: Institute protective procedures and install protective materials as required to ensure that work of this section will be without damage or deterioration.

END OF SECTION 03450

SECTION 04200 - UNIT MASONRY

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 DESCRIPTION OF WORK

- A. Extent of each type of masonry work is indicated on drawings and schedule.
- B. Type of masonry work required includes:
 - 1. Concrete unit masonry.
 - 2. Brick masonry.
 - 3. Cast Stone.
 - 4. Mortar and grout.
 - 5. Reinforcement, anchorage, and accessories.
 - 6. Concealed Flashing
 - 7. Installation of miscellaneous loose steel lintels, plates and other steel fabrications.
- C. Related Work:
 - 1. Section 05120 - Structural Steel.
 - 2. Section 05400 - Miscellaneous Structural Steel.
 - 3. Section 05500 - Metal Fabrications.
 - 4. Section 07600 - Flashing.
 - 5. Section 07900 - Joint Sealer Assemblies.
 - 6. Section 08110 - Hollow Metalwork.
 - 7. Section 09900 - Painting of exposed to view CMU surfaces.

1.3 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.
- B. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- C. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

- D. Field Constructed Mock-Ups: Prior to installation of masonry work, erect sample wall panels to further verify selections made for color and textural characteristics, under sample submittals of masonry units and mortar, and to represent completed masonry work for qualities of appearance, materials and construction.
- E. Build mock-up(s) in size of approximately 18" long by 18" high, brick panel to confirm selection of brick and mortar match.
- F. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
- G. Masonry Pre-Installation Meeting: Prior to installation of any above-grade masonry work, there shall be a Masonry Pre-Installation Meeting between the General Construction Work Contractor, all masonry Subcontractors (if any), and the Architect. At this meeting, all masonry construction products and procedures shall be reviewed.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.
- B. Samples for Verification Purposes: Submit the following samples:
 - 1. For selection of brick, submit products of all local manufacturers that the manufacturers consider to be their closest match. Resubmit until match meets approval of Architect.
 - 2. Cast Stone samples not less than 12 inch square showing full range of exposed color and texture to be expected in finish work.
 - 3. Colored masonry mortar samples for each color required showing the full range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used.
- C. Shop Drawings: Submit shop drawings for the following:
 - 1. All locations of Vertical Control Joints for interior concrete masonry unit walls including control joints shown.
 - 2. Cast Stone Sills.
- D. Cast Stone Standards:
 - 1. Cast stone mix and certification of compliance with standard ASTM C 1364 testing requirements. Include testing for freezing and thawing resistance.
 - 2. Cast Stone Institute Standard Specification (latest edition).

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
- C. Limit moisture absorption of concrete masonry units during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.
- D. Store cementitious materials off the ground, under cover and in dry location.
- E. Store aggregates where grading and other required characteristics can be maintained.
- F. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.6 REFERENCE STANDARDS

- A. Comply with the current applicable provisions of all codes, regulations, industry standards and specifications referenced in this section, unless otherwise modified by the requirements of the Contract Documents, including but not limited to the following:
 - 1. ACI 531 Building Code Requirements for Masonry Structures.
 - 2. ACI 531 Commentary on Building Code Requirements for Masonry Structures.
 - 3. ACI 530.1 Specification for Masonry Construction.
 - 4. ASTM C-90 Load Bearing Masonry Units.
 - 5. ASTM C-129 Non-Load Bearing Masonry Units.
 - 6. ASTM C 140 Testing Concrete Masonry Units.
 - 7. ASTM C 216 Testing Facing Brick (Solid Masonry Units Made from Clay or Shale).
 - 8. ASTM C 270 Standard Specification for Mortar for Unit Masonry
 - 9. ASTM C 780 Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
 - 10. ASTM C 1586 Standard Guide for Quality Assurance of Mortars.
 - 11. ASTM E - 119 Fire Tests with Building Construction and Materials.
 - 12. BIA Technical Notes on Brick Construction.
 - 13. BIA Technical Notes on Brick Construction: Technical Note #46 "Maintenance of Brick Masonry.
 - 14. NCMA TEK Bulletins.
 - 15. ASTM 1364 Cast Stone Masonry
 - 16. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.7 PROJECT CONDITIONS

- A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.
- C. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.
- D. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- F. Protect sills, ledges and projections from droppings of mortar.
- G. Cold Weather Protection:
 1. Do not lay masonry units which are wet or frozen.
 2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
 3. Remove masonry damaged by freezing conditions.
 4. For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements:
 - a. For units with surface temperatures above 32°F (0°C), wet with water heated to above 70°F.
 - b. For units with surface temperature below 32°F (0°C), wet with water heated to above 130°F.
- H. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout.
- I. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10°F.
 1. 40 degrees F to 32 degrees F:
 - a. Mortar: Heat mixing water to produce mortar temperature between 40°F and 120°F. Setting time will be limited to 60 minutes from initial mixing.
 - b. Grout: Follow normal masonry procedures.
 2. 32 degrees F to 25 degrees F:

- a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40°F and 120°F; maintain temperature of mortar on boards above freezing.
 - b. Grout: Heat grout materials to 90°F to produce in-place grout temperature of 70°F at end of work day.
- 3. 25 degrees F to 20 degrees F:
 - a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40°F and 120°F; maintain temperature of mortar on boards above freezing.
 - b. Grout: Heat grout materials to 90°F to produce in-place grout temperature of 70°F at end of work day.
 - c. Heat both sides of walls under construction using salamanders or other heat sources.
 - d. Use windbreaks or enclosures when wind is in excess of 15 mph.
- 4. 20 degrees F and below:
 - a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40°F and 120°F.
 - b. Grout: Heat grout materials to 90°F to produce in-place grout temperature of 70°F at end of work day.
 - c. Masonry Units: Heat masonry units so that they are above 20°F at time of laying.
 - d. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40°F for 24 hours after laying units.
 - e. Do not heat water for mortar and grout to above 160°F.
- J. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperature ranges apply to anticipated minimum night temperatures.
 - 1. 40 degrees F to 32 degrees F:
 - a. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.
 - 2. 32 degrees F to 25 degrees F:
 - a. Completely cover masonry with weather-resistive membrane for at least 24 hours.
 - 3. 25 degrees F to 20 degrees F:
 - a. Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.

4. 20 degrees F and below:
 - a. Except as otherwise indicated, maintain masonry temperature above 32°F (0°C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40°F (4°C) for 48 hours.

1.8 WARRANTY

- A. Flexible Copper Flashing:
 1. Special warranty:
 - a. Manufacturer shall warrant flexible flashing material for **life of the wall**.
 - b. Begin warranty from the Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Manufacturer: Obtain masonry units from one manufacturer, of uniform texture and color for each kind required, for each continuous area and visually related areas.
 1. Brick: Subject to compliance with requirements, manufacturers of brick units which may be incorporated in the work include, but are not limited to, the following:
 - a. Church Brick Company.
 - b. Consolidated Brick.
 - c. Diener Brick Company.
 - d. Tri-State Brick & Building Materials, Inc.
 - e. The Belden Brick Company.
 - f. Or approved equal.
 2. Concrete Masonry Units: Subject to compliance with requirements, manufacturers of concrete masonry units which may be incorporated in the work include, but are not limited to, the following:
 - a. Anchor Concrete Products Inc.
 - b. Clayton Block Co., Inc.
 - c. EP Henry Corporation.
 - d. Or approved equal.
 3. Masonry Anchors, Joint Reinforcing, Accessories, etc.: Subject to compliance with requirements, manufacturers of masonry anchors, joint reinforcing, accessories which may be incorporated in the work include, but are not limited to, the following:
 - a. Heckman Building Products, Inc.
 - b. Hohmann & Barnard, Inc.
 - c. Or approved equal.

2.2 BRICK MADE FROM CLAY OR SHALE

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.

- B. Size: Provide bricks manufactured to the following actual dimensions: Match existing.
- C. For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncored or unfrogged units with all exposed surfaces finished.
- D. Facing Brick: ASTM C 216, and as follows.
 - 1. Grade SW.
 - 2. Type: FBS.
 - 3. Compressive Strength: 8,000 psi, average, per ASTM C 67.
 - 4. Application: Use where brick is exposed, unless otherwise indicated.
 - 5. Texture and Color: Match existing.
 - 6. Wherever shown to "match existing", provide face brick of matching color, texture and size as existing adjacent brickwork.
- E. Efflorescence: Provide brick tested and rated in compliance with ASTM C67.

2.3 CONCRETE MASONRY UNITS

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
- B. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
 - 1. Provide bullnose units for outside corners unless otherwise indicated.
- C. Concrete Block: Provide units complying with characteristics indicated below for face size, exposed face and under each form of block included, for weight classification.
- D. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thicknesses indicated.
- E. Hollow Loadbearing Block: ASTM C 90 and as follows:
 - 1. Weight Classification: Lightweight.
- F. Solid Loadbearing Block: ASTM C 90 and as follows: (Below grade and wherever else solid CMU is indicated).
 - 1. Weight Classification: Lightweight.
- H. Solid 4" and 6" CMU (2 Hour Fire Resistance Rated) Loadbearing Block: Standard Method for Determining Fire Resistance of Concrete and Masonry Assemblies - ANSI/ACI 216.1-97, TMS-0216-97 and as follows:
 - 1. Construction and material requirements of concrete masonry including units, mortar, grout, control joint materials and reinforcement shall comply with ACI 530/ASCE 5/TMS 402.

2. Concrete masonry units shall comply with ASTM C 55, C 73, C 90 or C 129.
3. Weight Classification: Lightweight.
4. Aggregate Type: Expanded clay, expanded shale or expanded slate with a minimum required equivalent thickness of 3.6 inches for 4" CMU.

2.4 CAST STONE CAP

- A. Basis of Design: Provide cast stone as manufactured by Reading Rock®, Inc.; or approved equal.
 1. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include but are not limited to the following:
 - a. Custom Cast Stone, Inc.
 - b. American Artstone
 - c. Or approved equal
 2. Other acceptable manufacturers shall have a recommended minimum of ten (10) years of continuous operation and adequate facilities for producing and curing machine-made Cast Stone units as described herein.
 3. Manufacturer shall be a member of the Cast Stone Institute.
- B. Provide cast stone of size, shape and thickness indicated.
- C. Physical Properties:
 1. Compressive Strength: ASTM C 1364.
 2. Absorption, Cold Water: ASTM C 1364.
 3. Linear Shrinkage: ASTM C 1364.
 4. Surface Texture: ASTM C 1364.
 5. Cast Stone Materials:
 - a. Portland Cement: ASTM C 150, Type I, white/or gray as required to match specified color,
 - b. Coarse Aggregate: ASTM C 1364, Granite, quartz, or limestone,
 - c. Fine Aggregate: ASTM C 1364, Natural or manufactured sands,
 - d. Coloring Pigments: ASTM C 1364, Inorganic iron oxides,
 - e. Chemical Admixtures: ASTM C 1364.
 - f. Water: Potable.
- D. Color and finish: To be selected by the Architect from manufacturer's available full range of standard colors and finishes.
 1. Exposed surfaces shall exhibit a fine grained texture similar to natural stone. No bugholes or air voids will be permitted.
 2. Variation:
 - (a) Must match color and finish of approved sample when viewed in direct light at a 10 foot distance.

- b. Permissible Variation in Color:
 - 1) Hue Difference - ASTM C 1364, 2 units.
 - 2) Total Color Difference - ASTM C 1364, 6 units..
- E. Anchors: Non-corrosive type, sized for conditions:
 - 1. Provide Stainless steel type 304 anchors, pins, dowels and clip angles as indicated or if not indicated as required for each cast stone units and panels.
 - 2. Shelf angles and other similar structural items shall be galvanized steel.
- F. Reinforcement: Where required by ASTM C 1364, Epoxy coated or galvanized.
- G. Fiber Reinforcement: ASTM C 1116, fibrous nylon
- H. Mortar: Cast Stone Institute Standard Specification.
- I. Curing, Finishing and Cleaning: Provide methods and products which had been approved or recommended by manufacturer of the cast stone units.
- J. Cleaner:
 - 1. Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces.
 - 2. Approved for intended use by cast stone manufacturer and approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

2.5 MORTAR AND GROUT MATERIALS

- A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
- B. Limit cementitious materials in mortar to portland cement-lime.
- C. Portland Cement: ASTM C 150, Type 1, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.
- D. For colored aggregate mortars use masonry cement, ASTM C 91, of natural color or white as required to produce mortar colors required.
- E. Hydrated Lime: ASTM C 207, Type S.

- F. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100% passing the No. 16 sieve.
 - 1. White Mortar Aggregates: Natural white sand or ground white stone.
 - 2. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.
- G. Mortar: ASTM C387, Type N. Provide mortar for face brick and accessories to match original mortar in color, texture, strength and hardness (density and porosity). Determine existing mortar mix constituents and ratios by analysis. Review laboratory evaluations with Architect before proceeding with the work. Match color of existing mortar by use of aggregates matching original aggregate color where possible. Use inorganic coloring pigments if satisfactory color match cannot be attained with natural materials.
 - 1. Use Type M mortar for masonry below grade and in contact with earth, and where indicated.
 - 2. Use Type S mortar for exterior, above-grade loadbearing and non-loadbearing CMU walls; for interior loadbearing CMU walls; and for other applications where another type is not indicated.
- H. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.
- I. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.
- J. The proper use of ASTM C 270 and Test Method ASTM C 780 for evaluating masonry mortars produced in the laboratory and the construction site is in accordance with ASTM C 1586.
- K. Aggregate for Grout: ASTM C 404.
- L. Water: Clean and potable.
- M. Colored Aggregate Mortar: Produce mortar of color required by use of colored aggregates in combination with selected cementitious materials.
 - 1. Colors as selected by the Architect from manufacturer's available full range of colors.

2.6 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

- A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:

1. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
- B. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
1. Width: Fabricate joint reinforcement in units with widths of approximately 2 inch less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8 inch on joint faces exposed to exterior and 1/2 inch elsewhere.
 - a. Wire Size for Side Rods: 9 gauge.
 - b. Wire Size for Cross Rods: 9 gauge.
 2. Truss design with continuous diagonal cross rods spaced not more than 16 inch o.c.
 3. Number of Side Rods: One side rod for each face shell of concrete masonry back-up and one rod for brick wythe.
 4. Configuration:
 - a. Applications of Single Wythe Wall width: Truss design, diagonal cross rods at not more than 16 inches on center.
 - 1) Basis of Design: Provide Hohmann & Barnard, Inc., No.# 120, Truss-Mesh; or approved equal.
 - b. Applications of more than one unit width, exterior cavity walls (Masonry back-up), Seismic design:
 - 1) Basis of Design: Provide Hohmann & Barnard, Inc., No.# 170-ML (Mighty-LOK®); or approved equal.
- C. Flexible Anchors: Where flexible anchors are indicated for connecting masonry to structural framework, provide 2-piece anchors as described below which permit vertical or horizontal differential movement between wall and framework parallel to, but resist tension and compression forces perpendicular to, plane of wall.
1. For anchorage to steel framework provide manufacturer's standard anchors with triangular-shaped wire tie section sized to extend within 1inch of masonry face. Coordinate with Steel Contractor for type and size required. Provide 3/16 inch diameter, hot-dip galvanized steel.
 2. Provide Hohmann & Barnard, Inc., Slip-Set Stabilizer to anchor new brick end caps to existing masonry wall(s); or approved equal.
- D. Unit Type Masonry Inserts in Concrete: Furnish cast iron or malleable iron inserts of type and size indicated.

2.7 CONCEALED FLASHING MATERIALS

- A. **Type 2:** Thru-Wall Copper Fabric Flashing (Asphalt-Free): (At the head of window, door and unit ventilator masonry openings, existing columns in masonry cavity wall or where indicated). Provide end dams where shown, or as required.
1. Basis of Design: "Multi Flash 500 Series", as manufactured by York Manufacturing, Inc., Sanford, ME, Tel.# 800.551.2828 / www.yorkmfg.com; or approved equal.
 - a. Subject to compliance with requirements of the Contract Documents, manufacturers offering products which may be incorporated in work include the following:
 - 1) "Copper Sealtite 2000®", as manufactured by Advanced Building Products Inc., Tel.# 800.252.2306.
 - 2) "Gorilla Flash GF-500, as manufactured by STS Coatings, Inc., Tel.# 830.995.5177.
 - 3) "Copper Seal", as manufactured by Wire-Bond, Inc., Tel.# 800.849.6722.
 - 4) Or approved equal.
 2. Type: Copper sheet bonded with rubber based adhesive, between two layers of fiberglass fabric weighing not less than 0.3 oz/layer with a minimum of 10 x 20 threads per inch.
 - a. Copper Type: CDA Alloy 110, 060 temper in accordance with ASTM B370.
 - b. Copper Weight: 5 oz. per square foot.
 3. Fabric: Fiberglass fabric; laminated to each face of copper core with core weight manufacturer identified on product with color coded laminate.
 4. Adhesive: Non-asphalt for laminating adhesive.
 5. Size: Manufacturer's standard roll width and length.
 6. Mastic/Sealant: Manufacturer's standard for specified flashing.
 - a. Type: One part 100% solids, solvent-free formulated silyl-terminated polyester (STPE), ASTM C920-11, Type S, Grade NS, Class 50.
 7. Provide "FTSA" stainless steel drip plate as manufactured by Hohmann & Barnard, Inc., Polyguard Products Inc., Masonpro Inc., Mortar Net USA Ltd., or approved equal, adhered to the Perm-A-Barrier Wall Flashing, between the steel lintel and the exterior finish masonry.
 - a. Provide factory fabricated stainless-steel drip plate from ASTM A240, Type 304, 26 gauge continuous, Type FTS with 1/8" thick compressible filler adhered to bottom of drip plate.

- 1) Extend horizontal leg flashing not less than 3-inches into masonry wall and bend down from outer edge of wall or steel lintel for 1/2" at 30 degree from horizontal, and hem.
 - 2) Fabricate in 8 to 12 feet lengths and provide stainless-steel splice plates at joints between lengths.
 - 3) Provide factory fabricated outside and inside corner pieces.
8. Termination Bar: Where indicated, or required, provide manufacturer's standard 1" wide, minimum by 1/8" thick, minimum by continuous length pre-punched stainless-steel bar or composite material bar complete with stainless-steel fasteners.
- a. Subject to compliance with requirements of the Contract Documents, manufacturers offering products which may be incorporated in work include the following:
 - 1) Heckmann Building Products, Inc., Melrose Park, IL, Tel.# 800.621.4140 / www.heckmannbuildingprods.com
 - 2) Or approved equal.
9. Provide specially fabricated units and interior corner conditions. Lap flashing a minimum of 6-inches and seal laps with mastic, or as recommended by manufacturer.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Non-Metallic Expansion Joint Strips: Premolded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade 2A1, capable of compression up to 35%, of width and thickness indicated.
- B. Fire Rated Control and Expansion Joints, Joint Filler and Sealant:
1. Provide fire-rated sealant in accordance with UL. Listed design for fire-rated joint assemblies.
 2. For expansion and control joint filler and sealant as specified in Section 07900.
- C. Weepholes: Provide the following for weepholes:
1. Plastic, Rectangular with screen: Item # 342 W/S; Hohmann & Barnard, Inc.; or approved equal
 - a. Medium density polyethylene 3/8 inch x 1-1/2 inch x 3-1/2 inch clear color plastic with stainless steel screens and cotton wicks.
- D. Mortar Net: Basis of Design: Provide Mortar Net as manufactured by Mortar Net USA, Ltd., Tel. # 800 664-6638; or approved equal.
1. Size: 10 inches high x 1 inch thick x 5 feet long.
 2. Provide mortar net inside masonry cavity walls to keep weepholes open. Install in accordance with manufacturer's printed instructions.

- E. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D226, Type I (No. 15 asphalt felt).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.
- B. Do not wet concrete masonry units.
- C. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- D. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.
- E. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8 inch of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- F. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- G. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible. No discoloration of units caused by cutting will be acceptable.
- H. Pattern Bond:
 - 1. Brick: Match existing.
 - 2. Concrete masonry units: Running bond, unless otherwise shown.
 - 3. Lay concealed masonry with all units in a wythe bonded by lapping not less than 2 inches.
- I. All concrete masonry units and courses below grade shall be filled solid with grout.

3.2 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4 inch in 10 feet, or 3/8 inch in a story height not to exceed 20 feet, nor 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 feet maximum, nor 1/2 inch in

40 feet or more. For vertical alignment of head joints do not exceed plus or minus 1/4 inch in 10 feet, 1/2 inch maximum.

- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet maximum, nor 1/2 inch in 40 feet or more. For top surface of bearing walls do not exceed 1/8 inch between adjacent floor elements in 10 feet or 1/16 inch within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch nor plus 1/2 inch.
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not exceed head joint thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
- C. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- D. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
 - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
 - 2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
 - 3. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.
- E. Extend all interior walls full height to underside of structure of deck, unless otherwise indicated. Include compressible insulation at top to completely close space between wall and structure above.

- F. Support and protect masonry, indicated to remain, which surrounds removal area.
1. Refer to BIA, Technical Note #46: "Maintenance of Brick Masonry", www.gobrick.com/Portals/25/docs/Technical%20Notes/TN46.pdf, for two recommended methods to properly support existing brickwork when installing new mechanically keyed through wall flashing, and as indicated below:
 - a. Method 1: Remove alternate sections of masonry in 2'-0" to 5'-0" (610 mm to 1.52m) lengths.
 - b. Method 2: Temporary braces can be installed to permit the removal of longer sections of masonry.

Note: The replaced masonry should be properly cured (5 to 7 days) before the intermediate masonry sections or supports are removed.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay solid brick size masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.
- B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- C. Set stone units in full bed of mortar with all vertical joints slushed full. Fill dowel, anchor and similar holes solid. Wet stone joint surface thoroughly before setting; for stone surfaces which are soiled, clean bedding and exposed surfaces with fiber brush and soap powder followed by thorough rinsing with clear water.
- D. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8 inch joints.
- E. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- F. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- G. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.5 CAVITY WALLS

- A. Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.

- B. Tie exterior wythe to back-up with continuous horizontal joint reinforcing, installed in mortar joints at not more than 16" o.c. vertically.
- C. Provide weep holes in exterior wythe of cavity wall located immediately above ledges and flashing, spaced 2'-0" o.c., unless otherwise indicated.
- D. Provide concealed flashing in cavity walls at all required locations and as indicated herein after.

3.6 HORIZONTAL JOINT REINFORCEMENT

- A. Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
 - 1. Space continuous horizontal reinforcement as follows:
 - a. For multi-wythe walls (solid or cavity) where continuous horizontal reinforcement acts as structural bond or tie between wythes, space reinforcement as required by code but not more than 16 inches o.c. vertically.
 - b. For single-wythe walls, space reinforcement at 16" o.c. vertically, unless otherwise indicated.
 - 2. Cut reinforcement units at walls intersecting and/or abutting firewalls. Provide control joints with fire-rated sealant as indicated in Section 07900.
- D. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

3.7 ANCHORING MASONRY WORK

- A. Provide anchoring devices of the type indicated. If not indicated, provide standard type for facing and back-up involved.
 - 1. Strap anchors for masonry at existing walls.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Provide vertical and horizontal expansion, control and isolation joints in masonry maximum 30 feet on center. Build-in related items as the masonry work progresses.

1. Coordinate location of all control and expansion joints in the field with Architect prior to commencement of work.
- B. Build in joint fillers where shown: See Section 07900, Joint Sealers. Joint width for sealants: 3/8 inch unless otherwise indicated. Include straight joints at vertical recessed brick detail.

3.9 LINTELS

- A. Install loose lintels weighing 200 lbs. or less of steel. Steel lintels weighing more than 200 lbs. will be installed by Structural Steel (Sub)Contractor.
- B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.10 FLASHING OF MASONRY WORK

- A. **NOTE: When Contractor must remove a portion of the existing masonry wall veneer in order to install through wall flashing or other work, the Contractor MUST follow the Brick Industry Association (Technical Note #46) and the Concrete Masonry Industry methodology to support and protect the existing adjacent masonry, indicated to remain, which surrounds removal area. The Contractor shall remove the proper length of masonry and leave adjacent masonry in place to support existing masonry above the work in lengths indicated below.**

1. Refer to BIA, Technical Note #46: "Maintenance of Brick Masonry", www.gobrick.com/Portals/25/docs/Technical%20Notes/TN46.pdf, for two recommended methods to properly support existing brickwork when installing new mechanically keyed through wall flashing, and as indicated below:
 - a. **Method 1:** Remove alternate sections of masonry in 2'-0" to 5'-0" (610 mm to 1.52m) lengths.
 - b. **Method 2:** Temporary braces can be installed to permit the removal of longer sections of masonry.

Note: The replaced masonry should be properly cured (5 to 7 days) before the intermediate masonry sections or supports are removed.

- B. General: Provide concealed flashing in masonry work at, or above, shelf angles, lintels, ledges and the base of perimeter cavity walls and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing in wall and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.
 1. **Contractor shall provide concealed flashing in masonry at all required conditions, whether shown or not, and shall be typical and/or similar for all building conditions when details and notes are shown on drawings.**

2. **Contractor shall provide spandrel beam membrane flashings for all steel beams exposed to cavity, whether shown or not, and shall be typical and/or similar for all building conditions when details and notes are shown on drawings.**
 3. **Contractor shall provide mechanically keyed through wall flashings at rising walls above roof conditions and or where indicated in cavity wall construction, whether shown or not. Flashings shall be typical and/or similar for all building conditions when details and notes are shown on drawings.**
- C. Extend flashing the full length of ledges. Lap all flashing a minimum of 4 inches and seal laps with mastic or as recommended by manufacturer. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 8 inches, and through the inner wythe to within third of width of the inner wythe as indicated on drawings.
- D. Extend flashing the full length of lintels and shelf angles and minimum of 4 inches into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 8 inches, and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2 inches.
1. At heads and sills flashing shall extend 6 inches beyond each side of the opening and to be turned up at the sides/ends not less than 2 inches to form a pan, (end dam). All corners shall be folded, not cut.
- E. Lap all flashing a minimum of 4 inches and seal laps with mastic or as recommended by manufacturer.
- F. Provide weep holes in the head joints of the same course of masonry bedder in the flashing mortar. Space 24 inches o.c., unless otherwise indicated.
- G. Install reglets and nailers for flashing and other related work where shown to be built into masonry work.

3.11 CAST STONE CAPS

A. EXAMINATION

1. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of cast stone.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. INSTALLATION

1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

2. Drench units with clear water just before setting.
3. Set units in full bed of mortar with full head joints, unless otherwise indicated. Build anchors and ties into mortar joints as units are set.
4. Fill dowel holes and anchor slots with mortar.
5. Fill collar joint solid as units are set.
6. Leave head joints open in coping and other units with exposed horizontal surfaces. Keep joints clear of mortar, and rake out to receive sealant.
7. Rake out joints for pointing with mortar to depths of not less than 3/4 inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.
8. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
9. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
10. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated, or as recommended by units manufacturer.
11. Sealing joints is specified in Division 7 Section "Joint Sealants."
12. Keep joints free of mortar and other rigid materials.

C. INSTALLATION TOLERANCES

1. Variation from Plumb: Do not exceed 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
2. Variation from Level: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet.
3. Variation in Plane between Adjacent Surfaces (Lipping): Do not exceed 1/16-inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

D. ADJUSTING AND CLEANING

1. 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.
2. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

3. In-Progress Cleaning: Clean cast stone as work progresses. Remove mortar fins and smears before tooling joints.
4. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
 - a. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - b. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

3.12 QUALITY CONTROL TESTING

- A. Engage an independent testing and inspection agency to inspect engineered masonry and to perform tests and prepare test reports.
 1. Perform tests for condition, size, location and spacing of reinforcement and anchorage of engineered masonry assemblies.
- B. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with design requirements and indicated standards, and specifically state any deviations therefrom.
 1. Provide access for testing agency to places where structural steel reinforcement and anchorage work is being fabricated or produced so that required inspection and testing can be accomplished.
 2. Testing agency may inspect structural steel reinforcement and anchorage work at plant before shipment; however, Architect reserves right, at any time before final acceptance, to reject material not complying with specified requirements.
- C. Correct deficiencies in structural steel reinforcement and anchorage work which inspections and laboratory test reports have indicated to be not in compliance with requirements.
 1. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

3.13 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

- C. Clean exposed brick masonry surfaces by the bucket and brush hand cleaning method or by high pressure water method. Comply with requirements of BIA Technical Notes No. 20 "Cleaning Brick Masonry".
 - 1. Use commercial cleaning agents in accordance with manufacturer's instructions.
- D. Clean exposed CMU masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Comply with recommendations in NCMA TEK Bulletin No. 28.
 - 1. Prepare exposed to view CMU surfaces to receive paint coatings in accordance with Section 09900.

END OF SECTION 04200

SECTION 05450 - COLD-FORMED METAL FRAMING

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 exterior non load-bearing steel-stud walls.

1.3 PERFORMANCE REQUIREMENTS

- A. AISI "Specifications": Calculate structural characteristics of cold-formed metal framing according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and the following:
 - 1. Allowable stress design, AISI CFSD-ASD
 - 2. AISI Load and Resistance Factor, AISI CFSD-LRFD
 - 3. Seismic requirements AISI CFSC-LRFD and ASCE 8-SSD-LRFD, for the design based on the load resistance factor design method, and the AISI CFSD-ASD and ASCE 8-SSD-ASD, for the design based on the allowable stress design method which shall meet the design modifications indicated in the International Building Code.
- B. Structural Performance: Engineer, fabricate, and erect cold-formed metal framing to withstand design loads within limits and under conditions required.
 - 1. Design framing systems to withstand design loads without deflections greater than the following:
 - a. Non Load-Bearing: Lateral deflection of 1/600 of the wall height.
 - 2. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 120°F (67°C).
 - 3. Design framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.
- C. Delegated Design:
 - 1. Engineering Responsibility: Engage a fabricator who assumes undivided responsibility for engineering cold-formed metal framing and anchors / fasteners by employing a qualified structural engineer licensed in the State of New Jersey, to prepare design calculations, signed and sealed shop drawings, and all other structural data.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of cold-formed metal framing, accessory, and product specified.
- C. Shop drawings showing layout, spacings, sizes, thicknesses, and types of cold-formed metal framing, fabrication, fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachments to other units of Work.
 - 1. For cold-formed metal framing indicated to comply with certain design loadings, include structural analysis data sealed and signed by the a structural engineer licensed in the State of New Jersey. Provide shop drawings prepared by cold-formed metal framing manufacturer.
- D. Mill certificates by manufacturers of cold-formed metal framing or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, and galvanized-coating thickness.
- F. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.
- G. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Product test reports from a qualified independent testing agency evidencing compliance with requirements of the following based on comprehensive testing:
 - 2. Expansion anchors.
 - 3. Powder-actuated anchors.
 - 4. Mechanical fasteners.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
 - 1. ASTM E329 can be used for on-site construction projects.

- C. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code-Steel" and AWS D1.3 "Structural Welding Code-Sheet Steel."
 - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.
- D. Structural Engineer Qualifications: A professional engineer legally authorized to practice in the State of New Jersey and experienced in providing engineering services of the kind indicated that have resulted in the installation of cold-formed metal framing similar to this Project in material, design, and extent and that have a record of successful in-service performance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling, as required in AISI's "Code of Standard Practice".
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation, as required in AISI's "Code of Standard Practice".

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
 - 1. Clark Dietrich Building Systems
 - 2. Marino\WARE; a Div. of WARE Industries, Inc.
 - 3. Super Stud Building Products, Inc.
 - 4. Or approved equal.

2.2 MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 - 1. Coating Designation: G60 (Z180).
 - 2. Grade: As required by structural performance.
- B. Steel Sheet for [Vertical Deflection] [Drift] Clips: ASTM A 1003/A 1003M, ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G90 (Z275).

2.3 WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs of web depths indicated, with lipped flanges, and complying with the following:

1. Design Uncoated-Steel Thickness: To meet structural performance requirements.
- B. Slotted Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; punched with vertical slots in both legs. Studs should be positively attached to deep-leg track using vertical slots while allowing free vertical movement. Legs designed to support horizontal and lateral loads and transfer them to the primary structure, as follows:
1. Product: ClarkDietrich Building Systems; MaxTrak Slotted Deflection Track, or a comparable product.
- C. Vertical Deflection Clips: Manufacturer's standard [bypass] [head] clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web and capable of resisting forces imposed by the wall system.
1. Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; [FCSC] [FCEC] [FTSC] [FTC3] [FTC5] [FS12] [FS15] [FS24] [QC], or a comparable product by one of the members of the SFIA.
 2. Minimum Uncoated-Steel Thickness: [Fast Clip Slide Clip; 0.0677 inch (1.72 mm)] [Extended FastClip Slide Clip; 0.0677 inch (1.72 mm)] [Flat Tail Slide Clip; 0.1180 inch (3 mm)] [Fast Top Clip; 0.0677 inch (1.72 mm)] [Fast Strut Clip; 0.0677 inch (1.72 mm)] [Quick Clip; 0.1180 inch (3 mm)].
- D. Headers and Jambs - Heavy-Duty Stud: Manufacturer's proprietary shape used to form header beams and jambs, columns or posts, of web depths indicated, unpunched, with stiffened flanges and as follows:
1. Product: ClarkDietrich Building Systems; [Heavy Duty Stud (HDS)] [and] [Header Bracket (HDSC)], or approved equal.
- E. U-Channel Assembly: Manufacturer's standard length U-Channel for lateral bracing for exterior curtain wall framing, loadbearing walls, or high interior partitions constructed of structural studs.
1. Product: ClarkDietrich Building Systems; U-Channel and FastBridge Clip [FB43] [FB68]; or approved equal.
 2. U-Channel Size: 1-1/2 inches (38.1 mm).
 3. U-Channel Minimum Uncoated-Steel Thickness: 0.0538 inch (1.37 mm).
- F. Bridging and Spacer Bar:
1. Product: ClarkDietrich Building Systems; TradeReady Spazzer 5400 (SPZS) [Spazzer Bar Guard (SPBG)]; or approved equal. .
 2. Minimum Uncoated-Steel Thickness: 0.0538 inch (1.37 mm).
 3. Size: 1-1/4 by 1-1/4 by 50 inches (32 by 32 by 1270 mm) long, pre-notched at 12, 16 and 24 inches (305, 406, and 610 mm) centers.

2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi (230 MPa).
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Gusset plates.
 - 5. Deflection track and vertical slide clips.
 - 6. Stud kickers and girts.
 - 7. Reinforcement plates.

2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36 (ASTM A 36M), zinc coated by the hot-dip process according to ASTM A 123.
- B. Cast-in-Place Anchor Bolts and Studs: ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); carbon-steel hex-head bolts and studs; carbon-steel nuts; and flat, unhardened-steel washers. Zinc coated by the hot-dip process according to ASTM A 153.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times the design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Powder-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times the design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: Corrosion-resistant coated, self-drilling, self-threading steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

2.7 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and the requirements of this Section.

1. Fabricate framing assemblies in jig templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed metal framing members by welding. Wire tying of framing members is not permitted.
 4. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to cold-framed metal framing manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.
 5. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to manufacturer's recommendations.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or distortion.
- C. Fabrication Tolerances: Fabricate assemblies to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet (1:960) and as follows:
1. Spacing: 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.
 2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements, including installation tolerances and other conditions affecting performance of cold-formed metal framing. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing and accessories plumb, square, true to line, and with connections securely fastened, according to ASTM C1007, AISI S200 "North American Standard for Cold-Formed Steel Framing - General Provisions", and to manufacturer's

recommendations and the requirements of this Section.

1. Cut framing members by sawing or shearing; do not torch cut.
 2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to cold-framed metal framing manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.
- C. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.
- D. Provide temporary bracing and leave in place until framing is permanently stabilized.
- E. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and double studs, inaccessible upon completion of framing work.
- F. Fasten reinforcement plate over web penetrations that exceed size of manufacturer's standard punched openings.
- G. Erection Tolerances: Install cold-formed metal framing to a maximum allowable tolerance variation from plumb, level, and true to line 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.

3.3 NONLOAD-BEARING INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Squarely seat studs against webs of top and bottom tracks. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as indicated or if not indicated to meet structural performance requirements.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate steel framing from building structure at locations indicated to prevent transfer of vertical loads while providing lateral support.
 1. Install deflection track and anchor to building structure.

2. Connect studs with vertical slide clips to continuous angles or supplementary framing anchored to building structure.
- E. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners to provide a complete and stable framing system.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: A qualified independent testing agency employed and paid by the Contractor will perform field quality-control testing.
- B. Field and shop welds will be subject to inspection and testing.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace Work that does not comply with specified requirements.
- E. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanizing repair paint according to ASTM A 780 and the manufacturer's instructions.
- B. Touchup Painting: Wire brush, clean, and paint scarred areas, welds, and rust spots on fabricated and installed prime-painted, cold-formed metal framing.
 1. Touchup painted surfaces with same type of shop paint used on adjacent surfaces.
- C. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer to ensure that cold-formed metal framing is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 05450

SECTION 05500 - METAL FABRICATIONS

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 DESCRIPTION OF WORK

- A. Definition: Metal fabrications include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere and non-ferrous items listed herein.
- B. Type of work in this section includes metal fabrications for assemblies which include but are not limited to the following:
 - 1. Rough hardware.
 - 2. Miscellaneous structural shapes.
 - 3. Aluminum pipe railing and handrails.
 - 4. Post Installed Anchors
- C. Related Work:
 - 1. Structural Steel, including loose lintels, specified in Sections 05120 and 05400 (Part 3).
 - 2. Steel Joists are specified in Section 05210 (Part 3).
 - 3. Metal Decking is specified in Section 05300 (Part 3).
 - 4. Miscellaneous Structural Steel is specified in Section 05400 (Part 3).
 - 5. Concrete work: Section 03300.
 - 6. Masonry work: Section 04200.
 - 7. Painting: Section 09900.

1.3 QUALITY ASSURANCE

- A. Codes and Standards:

ASTM A108-99 - Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.

ASTM A123 - Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

ASTM A563-00 - Standard Specification for Carbon and Alloy Steel Nuts.

ASTM A569/A569M-91a - Standard Specification for Steel, Carbon (.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality (superseded by A1011).

ASTM A780-01 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

ASTM A786/A786M-00b - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.

ASTM A1011/A1011M-03 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

ASTM F844-00 - Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.

AWS D1.1/D1.1M: Structural Welding Code - Steel, Welding qualification procedures and personnel.

- B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrications might delay work.
- C. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- D. Regulatory Requirements: Products and finished installations to be used by persons with disabilities must comply with requirements of the Uniform Construction Code, American National Standard, Accessible and Usable Buildings and Facilities, ICC / ANSI A117.1.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
- C. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.
- D. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.
- E. Mill test reports: Reports indicating metals to be furnished comply with project requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Aluminum: Comply with the following standards for the forms and types of aluminum for the required items of work.
 - 1. Alloy and Temper: Provide alloy and temper as recommended by the aluminum producer or finisher, with not less than the strength and durability properties specified in ASTM B 632/B 632 M, alloy 6061-T6.
 - 2. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of the metal to be welded, and as required for color match, strength and compatibility in the fabricated items.
 - 3. Fasteners: Finish of basic metal and alloy, matching finished color and texture as the metal being fastened, unless otherwise indicated. Unless otherwise shown, provide Phillips flat-head screws for exposed fasteners.
 - 4. Bituminous Paint: SSPC-Paint (cold-applied asphalt mastic).
 - 5. Protective Lacquer: Clear non-yellowing, of type recommended by metal producer for protection of the finished metal surfaces.
 - 6. Aluminum Pipe and Tube: ASTM B 429, Alloy 6063-T6.
 - 7. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
 - 8. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.
 - 9. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.
- C. Steel
 - 1. Steel Plates, Shapes and Bars: ASTM A 36/A 36M.
 - 2. Steel Tubing: Cold-formed, ASTM A 500; or hot-rolled, ASTM A 501.
 - 3. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
 - 4. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

5. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.
- D. Gray Iron Castings: ASTM A 48, Class 30.
- E. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
- F. Stainless Steel Sheet, Strip, Plate and Flat Bars: ASTM A 666, Type 304, unless otherwise indicated.
1. Stainless Bars and Shapes: ASTM A 276, Type 304.
- G. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- H. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
- I. Grout:
1. Non-Shrink, Metallic Grout: Pre-mixed, factory-packaged, ferrous-aggregate grout complying with CE CRD-C588, Type M, and ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications and not to be used in wet areas or on exterior applications.
 2. Non-Shrink, Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621, and ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
- J. Fasteners:
1. General: Provide zinc-plated fasteners complying with ASTM B 633, Class Fe/Zn 5, for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
 2. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A, with hex nuts, ASTM A 563; and where needed, flat washers.
 3. Weathering Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3, with hex nuts, ASTM A 563, Grade C3; and where needed, flat washers.
 4. Lag Screws: Square head type, ASME B18.2.1.
 5. Machine Screws: Cadmium plated steel, ASME B18.6.3.
 6. Wood Screws: Flat head, carbon steel, ASME B18.6.1.

7. Plain Washers: Round, carbon steel, ASME B18.22.1.
 8. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
 9. Expansion Anchors: Anchor bolt and sleeve assembly; Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
 10. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as needed.
 11. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1.
 12. Eyebolts: ASTM A 489.
 13. Anchor Bolts: ASTM F 1554, Grade 36, of dimension indicated; with nuts, ASTM A 563; and where indicated, flat washers.
- K. Anchors, General: Anchors 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 according to ASTM E 488, conducted by a qualified independent testing agency.
- L. Cast-in-Place in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- M. Post-Installed Anchors:
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5, unless otherwise indicated.
 2. Material for Exterior Locations and Where Stainless Steel is indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 and nuts, ASTM F 594.
- N. Paint:
1. Metal Primer Paint: Red lead mixed pigment, alkyd varnish, linseed oil paint, FS TT-P-86I, Type II; or red lead iron oxide, raw linseed oil, alkyd paint, Steel Structures Painting Council (SSPC) Paint 2-64; or basic lead silico chromate base iron oxide, linseed oil, alkyd paint, FS TT-P-615, Type II.
 2. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900.
 3. Galvanizing Repair Paint: High-zinc-dust content paint for regalvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SSPC-Paint-20 and compatible with paints specified to be used over it.

2.2 FABRICATION, GENERAL

A. Workmanship

1. Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
3. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
4. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
5. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
6. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

B. Galvanizing:

1. Provide a zinc coating for exterior steel items and those items indicated or specified to be galvanized, as follows:
 - a. ASTM A 153 for galvanizing iron and steel hardware.
 - b. ASTM A 123 for galvanized rolled, pressed and forged steel angles, corner guards, other indicated shapes, plates, bars, bollards and strip 1/8" thick and heavier.
 - c. ASTM A 386 for galvanizing assembled steel products.

C. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

D. Shop Painting

1. Shop paint miscellaneous metal work, except members of portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise indicated.

2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-2 "Hand Tool Cleaning", or SSPC SP-3 "Power Tool Cleaning", or SSPC SP-7 "Brush-Off Blast Cleaning".
3. Remove oil, grease and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning".
4. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at a rate to provide uniform dry film thickness of 2.0 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
5. Apply one shop coat to fabricated metal items, except apply two (2) coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

2.3 MISCELLANEOUS METAL FABRICATIONS

A. Rough Hardware

1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items as specified in Division-6 sections.
2. Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

B. Miscellaneous Structural Shapes, Framing and Supports, Etc.

1. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.
2. Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricated from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
3. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
4. Galvanize exterior miscellaneous frames and supports.

C. Aluminum Pipe Railing and Handrails:

1. Aluminum Railings and Handrails: Basis of Design: "Majestic Series", or as selected by the Architect as manufactured by AVCON, Lakewood, New Jersey, Ameristar Perimeter Security, USA; Integrity Aluminum Products, LLC; or approved equal.
2. Provide handrails to comply with applicable State and Local Regulatory Requirements and in accordance with minimum requirements indicated in the Uniform Construction Code, American National Standard, Accessible and Usable Buildings and Facilities, ICC / ANSI A117.1.
3. Structural Performances: Provide railing and handrail assemblies which, when installed, shall comply ASCE standards for minimum design loads for Handrail assemblies and Guardrail Systems and capable of withstanding the following loads applied as indicated:
 - a. To resist a load of 50 pound per linear foot applied in any direction at the top and to transfer this load through the supports to the structure.
 - b. To resist a single concentrated load of 200 pounds applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to the building structural assemblies, walls, floors or slabs. This load shall act concurrently with loads indicated in paragraph "a" above.
 - c. Guards: Intermediate rails and balusters capable of withstanding a horizontal concentrated load of 200 lb. applied on a one square foot area at any point in system of gross area of guard, including any open areas, of which they are a part. Load need not be assumed to be acting concurrently with uniform horizontal loads on top rails of railing assembly in determining stress on guard supporting members.
 - d. Guards shall be designated and constructed for a uniform load of 50 pounds per foot applied horizontally at required guardrail height and a simultaneous uniform load of 100 pounds applied vertically downwards at top of guardrail.
 - e. In-fill Area:
 - 1) Concentrated Load: 200 pounds, horizontal load , applied on a 1square-foot area at any point in the system, including intermediate rail or other elements serving this purpose.
 - 2) This loading condition shall not be applied simultaneously with loading conditions indicated above, (a. b. and c.).
4. Fabricate pipe railings and handrails to design, dimensions, and details indicated. Provide railings and handrails members formed of pipe of sizes and wall thickness indicated, or if not shown, as required to support indicated design loading. Unless otherwise indicated all shown dimensions for pipes, rails and other round shapes are outside diameter.

5. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - a. At tee and cross intersections provide coped joints.
 - b. At bends interconnect pipe by means of prefabricated elbow fittings or flush radius bends, as applicable, of radiuses indicated.
 - c. Perform welding to comply with applicable AWS specifications, using method appropriate for metal and finish indicated. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
6. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
7. Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.
8. Close exposed ends of pipe by welding 3/16" thick aluminum plate in place or by use of prefabricated fittings.
9. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.
10. Finish: Provide clear anodized finish.

2.4 MISCELLANEOUS MATERIALS

- A. Injectable Mortar: Provide and install injectable mortar at all post-installed anchors, as follows:
 1. Except where indicated on the drawings, post-installed anchors shall consist of the following anchor types as provided by Hilti, Inc., (800) 879-8000; or approved equal.
 - a. Anchorage to Concrete
 - 1) Adhesive anchors for cracked and uncracked concrete:
 - a) Hilti HIT-HY 200 Safe Set System with Hilti HIT-Z ROD per ICC ESR-3187.
 - b) Hilti HIT-HY 200 Safe Set System with Hilti Hollow Drill Bit System with HAS-E threaded rod per ESR-3187.
 - c) Hilti HIT-RE 500-SD Epoxy Adhesive Anchoring System with HAS-E Threaded Rod per ICC ESR-2322 for slow cure applications.

- 2) Medium duty mechanical anchors for cracked and uncracked concrete:
 - a) Hilti KWIK HUS-EZ and KWIK HUS EZ-I Screw Anchors per ICC ESR-3027.
 - b) Hilti KWIK BOLT-TZ Expansion Anchors per ICC ESR-1917.
 - c) Hilti KWIK BOLT 3 Expansion Anchors (uncracked concrete only) per ICC ESR-2302.

- 3) Heavy Duty mechanical anchors for cracked and uncracked concrete:
 - a) Hilti HDA Undercut Anchors per ICC ESR 1546.
 - b) Hilti HSL-3 Expansion Anchors per ICC ESR 1545.

- b. Rebar Doweling into Concrete
 - 1) Adhesive anchors for cracked and uncracked concrete use:
 - a) Hilti HIT-HY 200 Safe Set System with Hilti Hollow Drill Bit System with continuously deformed rebar per ICC ESR-3187.
 - b) Hilti HIT-RE 500-SD Epoxy Adhesive Anchoring System with continuously deformed rebar per ICC ESR-2322.

- c. Anchorage to Solid Grouted Masonry
 - 1) Adhesive Anchors:
 - a) Hilti HIT-HY 70 Masonry Adhesive Anchoring System (ICC pending).
 - b) Steel anchor element shall be Hilti HAS-E Continuously Threaded Rod or continuously deformed steel rebar.

 - 2) Mechanical Anchors:
 - a) Hilti KWIK HUS-EZ Screw Anchor per ICC ESR-3056.
 - b) Hilti KWIK BOLT-3 Expansion Anchors per ICC ESR-1385.

- d. Anchorage to Hollow/Multi-Wythe Masonry
 - 1) Adhesive Anchors:
 - a) Hilti HIT-HY 70 Masonry Adhesive Anchoring System per ICC ESR-3342.
 - b) Steel anchor element shall be Hilti HAS-E Continuously Threaded Rod or continuously deformed steel rebar.
 - c) The appropriate size screen tube shall be used per adhesive Manufacturer's recommendation.

2. Anchor capacity used in design shall be based on the technical data published by Hilti or such other method as approved by the Architect/Structural Engineer. Substitution requests for alternate products must be approved in writing by the Architect/Structural Engineer. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having an ICC ESR showing compliance with the relevant building code for seismic uses, load resistance, installation category, and availability of comprehensive installation instructions. Adhesive anchor evaluation will also consider creep, in-service temperature and installation temperature.

3. Install anchors per the manufacturer instructions, as included in the anchor packaging.
4. Overhead adhesive anchors must be installed using the Hilti Profi System.
5. The Contractor shall arrange an anchor manufacturer's representative to provide onsite installation training for all of their anchoring products specified. The Architect/Structural Engineer must receive documented confirmation that all of the Contractor's personnel who install anchors are trained prior to the commencement of installing anchors.
6. Anchor capacity is dependant upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings.
7. Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings that the bars can be cut, the Contractor shall review the existing structural drawings (if available) and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, by Hilti Ferroscan, GPR, X-Ray, chipping or other means.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION

- A. General
 1. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
 2. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
 3. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been

hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

4. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

B. Setting Loose Lintels and Plates:

1. Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
2. Set Loose Lintels, leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.
3. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 PIPE RAILINGS AND HANDRAILS

- A. Adjust railing prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated, or if not indicated, as required by design loadings. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:
- B. Anchor posts in concrete by means of sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with grout manufacturer's directions.
 1. Leave anchorage joint exposed; wipe off excess grout and leave 1/8 inch build-up, sloped away from post. For installation exposed on exterior or to flow of water, seal grout to comply with grout manufacturer's directions.
- C. Anchor rail ends into concrete and masonry with steel round flanges welded to rail ends and anchored into wall construction with lead expansion shields and bolts.
- D. Anchor rail ends to steel with aluminum oval or round flanges welded to rail ends and bolted to structural steel members, unless otherwise indicated.
- E. Secure handrails to wall with wall brackets and end fittings. Provide bracket with not less than 1-1/2" clearance from inside face of handrail and finished wall surface. Locate brackets as indicated, or if not indicated, at spacing required for design loading. Secure wall brackets and wall return fittings to building construction as follows:
 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

- F. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
- G. For hollow masonry anchorage, use toggle bolts having square heads.

3.4 ADJUST AND CLEAN

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.8 mils.
- B. For galvanize surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint.

END OF SECTION 05500

SECTION 06100 - CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Type of work in this section includes rough carpentry for:
 - 1. Wood nailers and blocking,
 - 2. Rough hardware,
 - 3. Construction panels.

1.3 SUBMITTALS

- A. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of American Lumber Standards Committee.
- B. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, installation and finishing of treated material.
- C. Fire-Retardant Treatment: Include certification by treating plant that treated material complies with specified standard and other requirements.

1.4 PRODUCT HANDLING

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
- B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.5 PROJECT CONDITIONS

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of nailers, blocking, and similar supports to allow attachment of other work.

- B. Maintain temperature and humidity in installation areas as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

- A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:
 - WWPA - Western Wood Products Association.
- C. Factory-mark each piece of lumber with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
- E. Provide dressed lumber, S4S, unless otherwise indicated.
- F. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing.

2.2 MISCELLANEOUS LUMBER

- A. Provide wood for support or attachment of other work including nailers, blocking, and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:
 - 1. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
 - 2. Grade: Construction Grade light framing size lumber of any species or board size lumber as required. Provide construction grade boards or No. 2 Boards.

2.3 CONSTRUCTION PANELS

- A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood panels and, for products not manufactured under PS 1 provisions, with American Plywood Association (APA) "Performance Standard and Policies for Structural-Use Panels", Form No. E445.
- B. Trademark: Factory-mark each construction panel with APA trademark evidencing compliance with grade requirements.

- C. Concealed APA Performance-Rated Panels: Where construction panels will be used for the following concealed types of applications, provide APA Performance-Rated Panels complying with requirements indicated for grade designation, span rating, exposure durability classification, edge detail (where applicable) and thickness.
- D. APA RATED SHEATHING
 - 1. Exposure Durability Classification: EXTERIOR.
 - a. Span Rating: As required to suit joist spacing indicated.
- E. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
 - a. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.

2.4 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.
- B. Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153).
- C. Building Paper: ASTM D 226, Type I; asphalt saturated felt, non-perforated, 15-lb. type.

2.5 WOOD TREATMENT BY PRESSURE PROCESS

- A. Fire-Retardant Treatment: Where fire-retardant treated wood ("FRT") is indicated or required, pressure impregnate lumber and plywood with fire-retardant chemicals to comply with AWPA C20 and C27, respectively, identify "FRT" lumber with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire treated wood shall have a flame spread of 25 or less and shall be dried to 19% moisture content for lumber and 15% for plywood. Exposed wood or wood subject to high humidity conditions shall be identified that the moisture content shall not exceed 28% when tested at 92% relative humidity in accordance with ASTM D3201.
 - 2. Treatment products: The following products, provided they comply with requirements of the contract documents will be among those considered acceptable:
 - a. "Dricon"; Hickson Corporation.
 - b. "Flame Proof LHC"; Osmose Wood Preserving, Inc.
 - c. "Pyro-Guard"; Hoover Treated Wood Products, Inc.
 - d. Or approved equal.
 - 3. Treat members shown on drawings and/or as required to meet the code requirements.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
- D. Countersink nail heads on exposed carpentry work and fill holes.
- E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD NAILERS AND BLOCKING

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Height of nailers shall be matched to that of the insulation being used. Nailers shall be firmly anchored to the deck to resist a force of seventy-five pounds per lineal foot. The type of anchors shall be as recommended by the roofing manufacturer and shall be secured at intervals required to ascertain a resistance force of seventy-five pounds per lineal foot.

3.3 INSTALLATION OF CONSTRUCTION PANELS

- A. General: Comply with applicable recommendations contained in Form No. E 30F, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Sheathing: Screw to framing or substrates.

END OF SECTION 06100

SECTION 07200 - BUILDING INSULATION

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 DESCRIPTION OF WORK

- A. Work included in this Contract: Contractor shall include all labor, materials, services, installation, equipment, etc., necessary to complete all building insulation (except roof insulation) to achieve complete and tight building thermal barrier to prevent the passage of exterior air into conditioned spaces and prohibit the formation of condensation.
 - 1. Provide indicated types of insulation as shown on drawings, as specified herein, and/or as required by all job conditions and building assemblies, whether clearly shown or not to achieve included work.
 - 2. Insulation types include but are not limited to the following:
 - a. Rigid board type perimeter insulation,
 - b. Fire safing insulation with UL approved coating,
 - 3. Related Work:
 - a. Section 03300 - Concrete Work,
 - b. Section 07840 - Through-Penetration Firestop Systems,

1.3 QUALITY ASSURANCE

- A. Thermal Conductivity: Thicknesses shown are for thermal conductivity (k-value at 75°F) specified for each material. Provide adjusted thicknesses as directed for equivalent use of material having a different thermal conductivity. Where insulation is identified by "R" value, provide appropriate thicknesses.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- C. Fire and Insurance Ratings: Comply with fire-resistance, flammability and insurance ratings indicated, and comply with governing regulations as interpreted by authorities.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation required. Include data substantiating that materials comply with specified requirements.
- B. Samples: Submit triplicate samples of the following listed items, in accordance with Contract Documents. Obtain Architect's approval before proceeding with ordering or fabrication of items of this section:
 - 1. Each type of insulation specified - 12 inches square.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General Protection and Handling: Protection from Deterioration: Do not allow insulation materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Extruded-Polystyrene Board Insulation:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company.
 - c. Owens Corning.
 - d. Tenneco Building Products.
 - e. Or approved equal.
 - 2. Fire Safing Insulation:
 - a. Industrial Insulation Group, LLC
 - b. Fibrex Insulations.
 - c. Isolatek International.
 - d. Owens Corning.
 - e. Rockwool, North America.
 - f. Or approved equal.
- B. Mineral-Wool Board Insulation:
 - 1. Semi-Refractory Fiber Board Fire Safing Insulation: Semi-rigid boards designed for use as a fire stop at openings between edge of slab and exterior wall panels, at top of masonry and wallboard walls/deck interface, and shall be produced by combining semi-refractory mineral fiber manufactured from slag with thermosetting resin binders.
 - 2. Unfaced, Mineral-Wool Board Insulation: ASTM C 612; with a flame-spread index of 15 and a smoke-developed index of zero, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

- a. Nominal density of 8 lb/cu. ft., Type III, thermal resistivity of 4.35°F x h x sq. ft./Btu x in. at 75°F.
 3. At all rated masonry and wallboard walls and partitions, rated slabs and exterior wall panels, the fire safing insulation shall be coated with 3M Firedam products, or approved equal, to achieve indicated UL design requirements.
- D. Rigid, closed-cell polystyrene insulation board; ASTM C578-87A, Type IV, 25 psi compressive strength; 1.1 perm-inch maximum vapor transmission; 0.1% maximum water absorption; manufacturer's standard lengths and widths. Provide insulation complying with a flame spread rating of 5 when tested in accordance with ASTM E84.
1. Basis of Design: Provide "Styrofoam Square Edge", by Dow Chemical Co., U.S.A.
 - a. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) DiversiFoam Products.
 - 2) Owens Corning.
 - 3) Tenneco Building Products.
 - 4) Or approved equal.
 - b. k-value of 0.20 per inch and an R value of 5.0 per inch.
 2. ANSI/ASHRAE/IES Standard 90.1-2013, requires R-15 rigid insulation under all slab on grade conditions along the perimeter of the exterior wall.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
 1. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.
 2. Provide complete and tight building thermal barrier, to prevent the passage of exterior air into conditioned spaces and prohibit the formation of condensation.
 3. Provide indicated types of insulation as shown on drawings, as specified herein, and/or as required by all job conditions, building assemblies, and whether clearly shown or not.
 4. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

C. Perimeter Insulation

1. On vertical surfaces, set units in adhesive applied in accordance with manufacturer's instructions. Use type of adhesive recommended by manufacturer of insulation.

D. Fire Safing Insulation

1. Install fire safing insulation at all indicated locations, as required by authorities having jurisdiction and in accordance with manufacturer's instructions.
2. Provide sealant material and type required for indicated applications. Provide fire rated type at rated assemblies.
3. Provide coating materials at indicated UL. rated assemblies.

- E. All installations of insulation and work of this section shall meet approval of Architect and all code authorities having jurisdiction at no additional cost to the Owner.

END OF SECTION 07200

SECTION 07410 - PREFORMED METAL ROOFING

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 DESCRIPTION OF WORK

- A. Extent of type of preformed roofing is indicated on the drawings and by provisions of this section. Preformed roofing is hereby defined to include panels which are structurally capable of spanning between supports spaced as indicated.
 - 1. Coordinate work of this section with installation of roofing substructure, substrate decking, and all other materials and trades affected by the work of this section.
 - 2. Provide panel system complete with all manufacturer's color coordinated assemblies, which include but are not limited to flashings, ridge and peak caps, eave and self drips, and counter flashings.
 - 3. Provide clips, fasteners, closures, and sealant as necessary to meet indicated design requirements, whether shown or not, and to ensure complete weather tight installation.
- B. Type of metal panels required include the following:
 - 1. Pre-finished, preformed metal sheet panels, intended for lapped-seam installation.
- C. Other Related Work:
 - 1. Snow Retention System: included under the work of this section.

1.3 QUALITY ASSURANCE

- A. Performance Test Standards: Provide preformed metal panel systems which have been pretested and certified by manufacturer to provide specified resistance to air and water infiltration and structural deflection and failure when installed as indicated and when tested in accordance with the following:
 - 1. UL 90 rated roofing system that has been tested in accordance with UL 580 test procedure.
 - 2. Resistance to Air Infiltration: .004 cfm/ linear foot when tested in accordance with ASTM E 1680 at static pressure differential of 12.00 psf.
 - 3. Resistance to Water Infiltration: No leakage through panel joints when tested in accordance with ASTM E 1648 at static pressure differential of 6.24 psf.

- B. Structural Requirements: Provide panels capable of spanning 5'-0" purlin spacing and maintain UL 90 wind uplift rating. Panel structural properties determined in accordance with latest edition of American Iron and Steel Institute's "Cold Formed Steel Design Manual", using "effective Width" concepts.
1. Provide confirmation of positive and negative buckling moments and uplift capacity determined by full-scale tests.
- C. Field Measurements: Where possible, prior to fabrication of prefabricated panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.
- D. Manufacturer's Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for a recommended period of not less than 10 years.
- E. Installer Qualifications: A company familiar with installing products included in this section and which has completed a recommended 20 installations similar in scope to work included in this section.
- F. Wind Uplift Resistance: Provide Panel assemblies which have been tested and bear Underwriters Laboratory Label UL 90 pursuant and in accordance with UL 580 test procedure.
- G. Special Project Warranties:
1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
 2. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 3. Warranty Period: **Two (2) years** from approved date of Substantial Completion.
 4. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - a. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - 1) Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - 2) Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 3) Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 4) Humidity Resistance: 2000 hours.
 - 5) Salt-Spray Resistance: 2000 hours.

- b. Finish Warranty Period: **Thirty-five (35) years** from approved date of Substantial Completion.
- 5. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - a. Warranty Period: **Twenty (20) years** from approved date of Substantial Completion.
 - b. **Manufacturer of Roofing System is further limited to one who will fulfill the following requirements:**
 - 1) Participates in a pre-roofing conference.
 - 2) Shows a record of continued production of the specified materials for a recommended period of twenty (20) years.
 - 3) Provides a list of executed projects in the State of New Jersey.
 - 4) Provides complete manufacturer's produced printed manuals describing the roofing membrane and accessory materials, technical specifications, method of installation, including manufacturer's standard detailed drawings.
 - 5) Furnishes guarantee as hereinafter specified.
- 6. Inspection: Upon 10%, 25% , 50%, 75% completion of the installation, an inspection shall be made by a technical representative of the roofing manufacturer to ascertain that the roofing system has been installed according to roofing manufacturer's latest published specifications and details.
 - a. There shall be no deviation made from this specification without prior written approval by the manufacturer and the Architect.
- H. Additional Design Requirements:
 - 1. Provide preformed metal panels one piece, single length roof panels from roof ridge to roof eave.
 - 2. Provide continuous interlocking standing seam that inherently increases load span capability, stiffness and flexural stress handling.
 - 3. Panels shall be provided with factory installed hot-melt sealant on bottom edge female seam leg.
- I. **The Contractor must obtain a letter from the Roofing Manufacturer stating that they have reviewed the project contract documents (drawings and specifications, including required warranties), and design details. The letter must also state that the roofing manufacturer has communicated with the Roofing Contractor about specific installation requirements which must be performed and has prepared Shop Drawings which comply with the design requirements. Any design details which are not in accordance with the contract documents must be brought to the attention of the Architect.**

- J. **Certifications:** The Contractor, Installer and Manufacturer (grantor) shall each submit certifications to the Architect that the contract documents including the materials, methods and details of work provided for therein, are adequate to accomplish the specified results.
1. Contractor shall provide manufacturer's "Roof Assembly Letter" confirming proposed roof system and decking description as follows:
 - a. Assembly,
 - b. Construction Type,
 - c. Maximum Slope,
 - d. Metal Engineered Panel,
 - e. Metal Panel Fastening.
- K. Mockup(s): Build mockup(s) to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for fabrication and installation..
1. Build mockup of typical roof area and eave as shown on Drawings, including, underlayment, attachments, and accessories.
 - a. Size: Approximately **12 feet square** (confirm with Architect for exact size of mock-up).
 - b. Include: Type of exposed seam and seam termination, fascia, soffit.
 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.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications, standard details, certified product test results, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.
- B. Samples:
1. Submit 2 samples 12" long of full width of panel showing metal gauge, seam profile, and finish material.
 2. Submit 2 complete sets of manufacturer's metal samples for selection of colors.
- C. Shop Drawings:
1. Submit a plan showing layout of the entire roof.
 2. Submit small-scale layouts of panels on walls and roofs, and large-scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim flashings, closures, and special details. Show all applicable dimensions and thickness of roofing parts and assemblies.
 3. Distinguish between factory and field assembly work.

- D. **Manufacturer's Certification:** Submit manufacturer's certification attesting that materials and finishes meet the requirements of the Contract Documents.
- E. **Test Reports:** Submit a copy of test report prepared by Underwriter Laboratories Inc.(UL), indicating wind uplift rating for the roofing system.
- F. **Certificates of Conformance:** Submit written certification forms signed and notarized by authorized representatives of the Contractor / Installer / Manufacturer attesting that:
 - 1. The referenced products have been furnished, inspected, and installed for this project and in complete conformance with requirements of the Contract Documents,
 - 2. The referenced products, covered under the work of this Contract, meet or exceed the requirements of "Basis of Design" project specification requirements, without any reduction in the quality, and performance.
- G. **Sample of Manufacturer's Warrantees:** Submit two (2) copies for manufacturer's original warrantees and guarantees.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Basis of Design:** "Series S2500" - 16" wide panels, with 180-degree mechanically fold seams, as manufactured by Englert; or approved equal.
 - 1. Subject to compliance with requirements, prefaced units which may be incorporated in the work include, but are not limited to, the following:
 - a. "TwinLok"TM by Imetco, an ESOP Company;
 - b. Equivalent system by ATAS International, Inc.;
 - c. "Tite-Loc Plus" by PAC-CLAD;
 - d. "Powerseam"TM by Fabral
 - e. Or approved equal.
- B. **Sheet Material and Thickness:**
 - 1. .032 Aluminum Alloy 3105-H14, or approved equal.
- C. **Engineer panels to use concealed anchors that permit expansion and contraction. Exposed fasteners in roofing panels will not be acceptable.**
- D. **Seam Size:**
 - 1. 2" high mechanical fold seam.
 - 2. 16" smooth flat panel.
- E. **Provide factory installed, continuous heat-resistant butyl-based in-seam sealant.**
- F. **Provide transition rib covers where roofing changes directions.**

G. Clips:

1. Provide UL listed clip designed to allow panels to thermally expand and contract.
2. Fabricate clips with embossments that raise underside panels above substrate to allow underside ventilation.
3. Fabricate clips with structurally embossed outstanding legs to prevent distortion due to wind uplift forces.

H. Provide factory eave panel notch for eave termination.

2.2 METAL FINISHES AND COLORS

A. General: Apply coatings either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating promptly after application and cure, by application of strippable film or removable adhesive cover, and retain until installation has been completed.

1. Provide smooth flat finish on all steel panels, unless otherwise directed by the Architect.

B. Liquid Fluoropolymer Aluminum Sheet Coil Coatings, AAMA 2605: 70 percent PVDF resin, by weight, in color coat and clear topcoat.

1. Product: PPG Industries, Inc., Duranar ULTRA-Cool.
2. Pencil Hardness, ASTM D 3363: HB - H.
3. Salt Spray Resistance, ASTM G 85: 1,000 hours.
4. Humidity Resistance, ASTM D 2247: 1,000 hours.
5. Dry Film Thickness, ASTM D 7901: 0.15 mil primer coat plus 0.70 mil color coat, 0.85 mil total, minimum thickness.
6. Color: As selected by the Architect from manufacturer's available full range of colors including custom colors.

2.3 MISCELLANEOUS MATERIALS

A. Internal Panel Framing: Manufacturer's standard, as indicated or as recommended by manufacturer for each indicated application.

B. Fasteners: Manufacturer's standard non-corrosive types, with exterior heads gasketed.

C. Accessories: Except as indicated as work of another specification section, provide components required for a complete roofing/siding system, including trim, copings, fascias, gravel stops, mullions, sills, corner units, ridge closures, clips, seam covers, battens, flashings, gutters, louvers, in-seam sealants, gaskets, fillers, closure strips and similar items.

1. Match materials/finishes of preformed panels.
 2. Closures: Provide closures at eaves and ridges, fabricated of same metal as sheet metal roofing.
 3. Clips: Minimum 0.0625-inch-thick, stainless-steel panel clips designed to withstand negative-load requirements.
 4. Cleats: Mechanically seamed cleats formed from the following material:
 - a. Metallic-Coated Steel Roofing: 0.0250-inch-thick, stainless-steel or nylon-coated aluminum sheet.
 5. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - a. Closures: Closed-cell, expanded, cellular, rubber or crosslinked polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match sheet metal roofing profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 6. Flashing and Trim: Formed from 0.0179-inch-thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating.
 - a. Provide flashing and trim as required to seal against weather and to provide finished appearance.
 - b. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fascia, and fillers. Finish flashing and trim with same finish system as adjacent sheet metal roofing.
- D. Provide "S-5! ColorGard Snow Retention System", as manufactured by Metal Roof Innovations, Ltd, Tel. 888.825.3432, www.S-5.com; or approved equal.
1. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Alpine Snow Guards®, Tel. # 888-766-4273, www.alpinesnowguards.com
 - b. Berger Building Products, Inc., Feasterville, PA., Tel.# 800.523.8852, www.bergerbuildingproducts.com.
 - c. Sno Gem, McHenry, IL, Tel.# 888.766.4367, www.snogem.com.
 - d. Snoblox, Lemoyne, PA, Tel.# 866.423.2569, www.snoblox.com.
 - e. LMCurbs.
 - f. Riddell & Company, Inc.
 - g. Snow Management Systems, a division of Contek, Inc.
 - h. TRA-MAGE, Inc.
 - i. Or approved equal.
 2. Provide stainless steel components.

3. Provide clips to suit indicated roofing systems.
4. Provide finish paint coating as selected by the Architect to match roofing panels.

2.4 PANEL FABRICATION; PERFORMANCES

- A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, and as required to fulfill indicated performance requirements which have been demonstrated by factory testing. Comply with indicated profiles and dimensional requirements, and with structural requirements.
- B. UL-Certified, Portable Roll-Forming Equipment Only: UL-Certified, portable roll-forming equipment capable of producing metal panels warranted maintain UL certification of portable roll forming equipment for the duration of the Work.
- C. Metal Gauges: Thicknesses required for structural performances, but not less than manufacturer's recommended minimums for profiles and applications indicated.
- D. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials which are non-compatible or could result in corrosion or deterioration of either material or finishes.
- E. Fabricate panel joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact in a manner which will minimize noise from movements within panel system.
- F. Condensation: Fabricate panels for control of condensation, including vapor inclusion of seals and provisions for breathing, venting, weeping and draining.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with panel fabricator's and material manufacturers' instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.
 1. Install panels with concealed fasteners.
- B. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.
- C. Seaming: Complete seaming of panel joints by operation of portable power-driven equipment of type recommended by panel manufacturer using vinyl weather seal.
- D. Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers

indicated or, if not otherwise indicated, types recommended by panel manufacturer.

- E. Install snow retention system in accordance with manufacturers' instructions.

3.2 CLEANING AND PROTECTION

- A. Damaged Units: Replace panels and other components of the work which have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.
- B. Cleaning: Remove temporary protective coverings and strippable films (if any) as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION 07410

SECTION 07500 - ROOFING, GENERAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The requirements of this section apply to the work specified in the following sections:
 - 1. Section 05310 - Steel Decking,
 - 2. Section 06100 - Carpentry,
 - 3. Section 07410 - Preformed Metal Roofing,
 - 4. Section 07600 - Flashing and Sheet Metal,
 - 5. Section 07800 - Roof Specialties and Accessories.
- B. This section includes alterations and tie-ins to existing roofing systems and as shown on the drawings.

1.2 QUALITY ASSURANCE

- A. Roofing and associated work, including work of all sections listed in 1.1 above, must be included in a single subcontract, so that there will be undivided responsibility for the specified performance of all component parts.
- B. Installer Prequalification: Installer must be a recognized Roofing Contractor, skilled and experienced in the types of work required, and equipped to perform workmanship in accordance with recognized standards.
 - 1. Minimum Experience: Not less than a recommended five (5) years experience in applications for indicated roofing systems, and in roofing projects of magnitude equivalent to the required work.
 - 2. Maintenance Proximity: Recommended location of not more than two hours normal travel time from Installer's maintenance plant to project site.
 - a. Optional Proximity: At Contractor's option, and with Owner's prior acceptance of Installer's certification that work of the Maintenance Agreement will be performed by a designated roofing contractor whose plant is located not more than two hours normal travel time from project site, the above requirements will be waived.
- C. Product Bid: The product bid must have past performance of installation on a roof in the state where project is located for a recommended minimum of five (5) years, under the same name of manufacturer as bid.
- D. Alterations to existing roofs: Contractor shall make necessary tie ins and alterations to existing roofs in accordance with details indicated and "Basis of Design" product requirements so as to maintain original warranty on existing roofs and/or achieve complete weather tight conditions.

1.3 SUBMITTALS

- A. Submit certification that the roof materials furnished for roof alterations and tie-ins is Tested and Approved by Factory Mutual as a Class 1-SH roof system with 1-90 Wind Uplift Requirements, or Listed by Underwriters Laboratories or Warnock Hersey for external fire tests of ASTM E - 108 Class A.
- B. Product Data for each type of product specified include manufacturer's technical product data, installation instructions, and recommendations for each type of roofing product required. Include data substantiating that materials comply with specified requirements.
- C. Shop Drawings: Submit roofing membrane layout drawings showing the outline of existing roof and locations of flashings and tie-ins, specific roofing details illustrating relationships with adjacent construction, and flashing details at indicated tie-in conditions.
 - 1. Submit shop drawings of manufactured and/or fabricated sheetmetal work.
 - 2. Contract Drawing Detail Approval: If the roofing manufacturer takes exception to the contract document details, the manufacturer shall provide the roofing contractor with acceptable details to be submitted to the Architect for approval. This Project must receive Architect's approval through this process prior to shipment of materials to the project site. All roofing work required by the roofing system manufacturer shall be included in the contract at no additional cost to the Owner.
- E. Samples: Samples of each material specified, properly labeled.
 - 1. Roof membrane: For project records, submit 8- by 10-inch samples of membrane cut from rolls of each type of material used on the project.
 - 2. Flashing membrane: Submit 12-inch-square samples of sheet material to be used for base flashings.
 - 3. Fasteners: Submit (2) of each type.
 - 4. Adhesives: Submit samples for each type to be used.

1.4 JOB CONDITIONS

- A. Roofing Conference: Prior to the installation of the roofing and associated work, meet at the project site with the Installer, the Installers of each component of associated work, and the Architect and other representatives directly concerned with performance of the work, including, where applicable, product manufacturers and the Owner. Record (by Contractor) the discussions of the conference and the decisions and agreements, or disagreements reached, and furnish a copy of the record to each party attending. Review foreseeable methods and procedures related to the roofing work including, but not necessarily limited to, the following:
 - 1. Review Project requirements (drawings, specifications and other contract documents).
 - 2. Review status of existing conditions and substrate (by the Roofing Installer), including extent of moisture penetration in existing work, drying and similar considerations.

3. Review availability of materials, tradesmen, equipment and facilities needed to make progress and avoid delays.
4. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
5. Review regulations concerning Code compliance, environmental protection, health, safety, fire and similar considerations.
6. Establish units of work, including preparation, such that each unit may be completed prior to end of each day's work.

B. Weather Condition Limitations:

1. During periods of inclement weather, Contractor shall use wet power vacuums, on the day following each rain, to remove standing water so as not to delay his operations.
2. Proceed with roofing and associated work only when weather conditions will permit unrestricted use of materials and quality control of the work being installed, complying with the requirements and the recommendations of the roofing materials manufacturers.
3. Proceed only when the Contractor is willing to guarantee the work as required and without additional reservations and restrictions.
4. Protect existing work and property from damage during the course of the work. Be prepared for all weather and other contingencies as prudence may dictate. Maintain on the site at all times sufficient and proper materials for temporary roofing and other protection when weather conditions prevent continuance of work and do not permit completion of each unit of work prior to the end of each working day. Temporary protection and roofing work must be provided at no additional cost to the Owner.
5. Remove and discard materials which have been used for temporary roofs, protection, water seals, and related work. Do not incorporate used materials into the work.

- C. Storage of Materials and Property: Do not overstress roof decks and supporting structures. Avoid placing loads at midspans of framing. All superimposed loads shall be well distributed. Do not store more material on roofs than can be installed in one and one-half working days. Store materials, except membrane, in dry area and protect from water and direct sunlight. Damaged materials shall be replaced at Contractor's expense. Protect adjacent work from damage due to roofing operations and related work. Provide temporary protection against walls adjacent to roofing work; remove protection upon completion.

PART 2 - PRODUCTS

2.1 GENERAL ROOFING MATERIALS

- A. Refer to other sections for new roofing work and all requirements of roofing materials, products and systems.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Contractor shall prepare a plan and submit it to the Architect for which identifies how the roofing repairs and all associated work will be performed so as to prevent foot traffic on the newly installed roofing system.
- B. Coordinate the installation of roofing materials and associated work so as to provide a complete system complying with the combined recommendations of manufacturers and installers involved in the work.
- C. Protect other work from spillage of roofing materials, and prevent materials from entering and clogging drains and conductors. Replace or restore other work which is soiled or otherwise damaged by the performance of the roofing and associated work.

3.2 PERFORMANCE REQUIREMENTS

- A. Initial Weather Resistance: It is required that the roofing and associated work be durable in normal weather exposure and not leak water during rainstorms. After completion of the roofing and associated work, and either during or immediately after a rainstorm, (and just before final acceptance of the work) the Installer shall meet with the Contractor at the project and inspect the building for evidence of leaks in the roofing and associated work. Prepare a written report without delay (by Contractor) covering the inspection, and submit to Owner (with copy to Architect). Should no rain occur between the time the roof is completed and when all punch list items have been corrected, this requirement shall be waived.
- B. Repair or replace roofing and associated work as required to eliminate leaks or other inability of roofing to initially withstand normal weather exposure.
 - 1. Abnormal weather exposure is recognized to include hailstorms, lightning strikes, hurricane and tornadic winds, and other unusual phenomena of the weather as frequently covered by building insurance.
- C. **Alterations and Tie-ins to Existing Roofs**
 - 1. Examine substrate surfaces to receive roofing system and associated work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
 - 2. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane.
 - 3. Cooperate with inspection and test agencies engaged or required to perform services in connection with roofing system installation.
 - 4. Insurance/Code Compliance: Install roofing and flashing work (and test where required to show) compliance with governing regulations.

5. Coordinate the installation of roofing sheets, flashings, stripping, so that roofing substrates are not exposed to precipitation nor exposed overnights. Provide cut-offs at the end of each day's work, to cover exposed substrates with a course of coated felt with joints and edges sealed with roofing cement. Remove cut-offs immediately before resuming work.
6. Substrate Joint Penetrations: Do not allow adhesive to penetrate substrate joints and enter building or damage existing or new insulation, vapor barriers (retarders) or other construction.
7. General Requirements: Apply roofing membrane in accordance with roofing material manufacturer's instructions. Application of roofing shall immediately follow application of base sheet and/or insulation as a continuous operation.

D. Agreement to Maintain Roofing: See Part 1, Section 01900, Guarantees and Warranties.

END OF SECTION 07500

SECTION 07600 - FLASHING, SHEET METAL AND ROOF ACCESSORIES

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. Section Includes:
 - 1. Pre-manufactured/pre-engineered fascia / metal edge / coping systems.
 - 2. Pre-manufactured metal flashing and counterflashing.
 - 3. Miscellaneous sheet metal accessories.
 - 4. Exposed metal field and shop fabricated sheet trim and fascia units, where indicated.
 - 5. Gutters and Downspouts.

- B. Related Sections:
 - 1. Unit Masonry: Section 04200
 - 2. Wood nailers and blocking: Section 06100.
 - 3. Roofing Materials: Elsewhere in Division 7.
 - 4. Roofing Manufacturer's furnished metal edge: Section 07410.
 - 5. Joint Sealer Assemblies: Section 07900.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Requirements: Design and install work of this section, including attachment to the structure, to safely withstand dead, live and wind loads prescribed by the International Building Code.

- B. Environmental Requirements: Provide for expansion and contraction of system components due to air temperature and solar heat gain. Provide systems which will accommodate movement due to temperature change without buckling, failure of seals, undue stress on structural elements, reduction of performance, or other detrimental effects.
 - 1. Anticipated air temperature range: Minus 10°F to +105°F.

1.4 REFERENCES

- A. Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

- B. ASTM B 32; Standard Specification for Solder Metal.

- C. ASTM B 209; Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

- D. ASTM B 101; Standard Specifications for Coated Copper Sheets and ASTM B 370; for Standard Specifications for Copper Sheets.

- E. Revere's "Copper and Common Sense", latest Edition.
- F. Aluminum Association, Design System for Aluminum Finishes (AA).
- G. American Architectural Manufacturers Association (AMMA), standards as referenced herein.
- H. ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roof Systems.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's specifications, standard details, and installation recommendations.
- B. Shop Drawings: Submit manufacturer's shop drawings showing material types, thickness, sizes, shapes, connections, layout, joining, profiles and anchorage of fabricated work and relation to adjacent work. edited product data or shop drawings, or a combination thereof, as required to accurately describe products to be provided. Show elevations, field measurements, reinforcement, expansion provisions, installation accessories, and detail sections of composite members. Draw layouts at scale of 1/4 inch per foot, details at scale of 3 inches per foot.

1. Provide shop drawings for, but not limited to, the following:

- a. Metal edge, fascia, coping.
- b. Flashing for roof drains and roof penetrations.
- c. Base flashing and counterflashing.
- d. Gutters, rain water conductors (downspouts), anchors and accessories.
- e. Drain insert strainer.
- f. All other sheet metal work requiring fabrication.
- g. Details of all joints for above.
- h. Reglets and wedges.

- 2. Sheet metal shop drawings shall be prepared to reflect SMACNA detail standards and in accordance with ANSI/SPRI ES-1 Test Protocols.

- C. Samples for Color Selection of Coated Finishes: Coating manufacturer's color selection data.
- D. Samples for Color Verification of Coated Finishes: For each type and color of coated finish submit 12-inch-long sections of extrusions and formed sections and 6-inch-square sheets.
- E. Pre-engineered fabricated and pre-finished sheet metal manufacturer's product literature, finish specification and sample finish warranty.
- F. Sheet metal fabricators and installers qualifications.

1.6 QUALITY ASSURANCE

- A. Listing - Roof Perimeter Flashing System: Provide system listed in Factory Mutual System's "Approval Guide," classified for Zone 2 (I-90 windstorm resistance).

- B. Fabricator / Installer: A firm having a recommended minimum of 5 years of successful experience in fabrication and installation of sheet metal work of type and scope equivalent, to work of this section.

NOTE: Metal Coping, Metal Edging shop fabricated by Contractor is unacceptable and will not be approved by Architect. These metals shall be pre-engineered, fabricated and furnished by the roofing manufacturer and or approved manufacturers below.

- 1. **Pre-engineered shop drawing must be submitted to the Architect before payment is authorized by the Architect for the work.**

- C. Pre-engineered and Contractor: Fabricate and install sheet metal work in accordance with indicated reference standards.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials off ground, under cover. Protect from damage and deterioration.
- B. Handle materials to prevent damage to surfaces, edges and ends of sheet metal items. Damaged material shall be rejected and removed from the site.

1.8 WARRANTY

- A. Warrant fascia, coping, gutters, downspout work to be free of defects in materials and workmanship, to resist blow-off and to be leak tight, due to conditions within stated design limits.
- B. Warrant Fluoropolymer coating to remain free, under normal atmospheric conditions, from peeling, checking, or cracking, and chalking in excess of numerical rating of 8 when measured in accordance with ASTM D659-86, or fading in excess of 5 N.B.S. units during warranty period.
 - 1. The Warranty period shall be **twenty (20) years** which starts the approved date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide pre-engineered manufactured products approved by the roofing system manufacturer(s) which may include but not limited to the following:
 - 1. Formed-Aluminum Metal Edging, Coping and Fascia:
 - a. Hickman: W.P. Hickman Co., Tel.# 828.676.1700, www.wph.com.
 - b. Imetco, an ESOP Company.
 - c. Metal-Era, Inc., Tel.# 800.558.2162, www.metalera.com.
 - d. Southern Aluminum Finishing Co., Tel.# 800.241.7429, www.saf.com.
 - e. or approved equal.

2. Formed-Aluminum Gutters and Downspouts:
 - a. Hickman: W.P. Hickman Co., Tel.# 828.676.1700, www.wph.com.
 - b. Metal-Era, Inc., Tel.# 800.558.2162, www.metalera.com.
 - c. Southern Aluminum Finishing Co., Tel.# 800.241.7429, www.saf.com.
 - d. Berger Building Products, Tel. 800.523.8852, www.bergerbuildingproducts.com
 - e. or approved equal.

3. Aluminum Reglets:
 - a. Fry Reglet Corporation, Tel.# 800.237.9773, www.fryreglet.com.
 - b. Hickman: W.P. Hickman Co., Tel.# 828.676.1700, www.wph.com.
 - c. Keystone Flashing Company, Tel.# 800.526.8348, www.keystoneflashing.com
 - d. CertainTeed, Saint-Gobain, Tel.# 800-233-8990, www.certainteed.com
 - e. or approved equal.

2.2 METALS

- A. Type "C"; Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
 1. Type "C-4"; Factory-Painted Aluminum Sheet: ASTM B 209, 3003-H14, with a minimum thickness of 0.040 inch, unless otherwise indicated.

2.3 COPINGS, FASCIA & ROOF EDGE

- A. Provide pre-engineered manufactured exposed coping components fabricated from the following metal:
 1. Formed-aluminum sheet in thickness indicated. Refer to Architectural drawings for thickness / height requirement(s).
 2. **Pre-engineered shop drawing must be submitted to the Architect before payment is authorized by the Architect for the work.**

- B. Provide fascia in shapes and sizes indicated, with shop-mitered and -welded corners.
 1. Include water dams formed from at least 0.028-inch- thick, galvanized steel sheet; anchor plates; cleats or other attachment devices; concealed splice plates; and trim and other accessories indicated or required for complete installation, with no exposed fasteners.

2.4 GUTTERS AND DOWNSPOUTS

- A. Provide gutters and downspouts in shapes and sizes indicated, with mitered and welded corners.

- B. Include aluminum straps formed from at least 0.080-inch- thick, aluminum sheet; hangers or other attachment devices; screens; end plates; and trim and other accessories indicated or required for complete installation.

1. Additional Features: Provide items below fabricated from the same metal as gutters and downspouts.
 2. Downspout starters (fascia sump) with downspout starter hole.
 3. Flow-through gravel stop with perforated vertical leg.
 4. Gutter Leaf Guard / Screen:
 - a. Basis of Design: Provide "Aluminum Screen" by Lynch Aluminum Manufacturing Co., or approved equal.
 5. Drain Insert Strainer:
 - a. Basis of Design: Overflow Type: Provide Drain inset and ball strainer as manufactured by Portal Plus Inc., Tel. (800) 624-8642; or approved equal.
 - 1) Drain shall be 15" O.D. spun aluminum drain flange and extruded aluminum outlet pipe in size indicated or as required for indicated applications.
 6. Downspout hanger; SMACNA FIG 1-35 H, and as indicated
 7. Concealed brackets for attachment to wall surface.
- C. Provide gutters and downspouts fabricated from the following metal:
1. Formed-aluminum sheet in thickness indicated, but not less than the following:
 - a. Gutters: Thickness: 0.050 inch.
 - b. Downspouts: Thickness: 0.050 inch.

2.5 REGLETS

- A. General: Provide reglets of type, material, and profile indicated, compatible with flashing. Form to securely interlock with counterflashing.
 1. Type - 3: Masonry Type: Provide "MA-1.5" (Brick) and "MA-4" (CMU) springlok Reglet by Fry Reglet Corp.; or approved equal.
 - a. Aluminum: 3003-H14 alloy, meeting ASTM B209-95, 0.040" thick aluminum, color as selected by Architect from manufacturer's standard colors.
 - b. Stainless Steel: Type 304 alloy, meeting ASTM A666-96a, 0.020" thick, 2B finish.
 - c. Provide 3" minimum lap joints.
 - d. Sawcut joint to receive reglet to a depth of approximately 1/4" greater than the depth of the horizontal back leg of reglet.
 - e. Insert reglet into sawcut and wedge in place using lead wedges installed at 12" o.c., minimum. Hammer wedges to a depth that will not interfere with sealant or backer rod.
 - f. Install sealant exterior sealant to form fillet bead minimizing holding of water.

2.6 COUNTERFLASHING

- A. Provide springlok counterflashing by Fry Reglet Corp.; Metal-Era; Xtreme Trim; or approved equal.
 - 1. 0.040" thick aluminum, as indicated on the drawings.
 - 2. Provide inside and outside corners including special angle where required.

2.7 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. GENERAL REQUIREMENTS:

- 1. All miscellaneous materials, accessories or other items essential to the completion of sheet metal installation, though not specifically shown or specified, must be provided.
 - 2. All such items, unless otherwise indicated on drawings or specified herein, shall be applied using sheet metal gauges which conform to recognized industry standards of sheet metal practices and without additional cost to the Owner. For sheet metal and pre-manufactured units, provide type of solder, ASTM B23, and corrosion-resistant metal as recommended by the producer of the metal sheets for fabrication and installation.
 - 3. Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gauge required for performance.
- B. Fasteners: Same metal as flashing/sheet metal, as indicated or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
 - C. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
 - D. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.
 - E. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed; comply with FS TT-S-00227, TT-S-00230, or TT-S-001543.
 - F. Epoxy Seam Sealer: 2-part non-corrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.
 - G. Paper Slip Sheet: 15-lb. rosin-sized building paper.
 - H. Polyethylene Underlayment: 6-mil carbonated polyethylene film; FS L-P-512.
 - I. Gutter Stripping Material: Provide "CCW-705-TWF" Membrane Flashing, as manufactured by Carlisle Coatings & Waterproofing Inc. or approved equal. Provide units in required width, trim as required.

2.8 FABRICATION, GENERAL

- A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.
- B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams (Metal other than Aluminum): Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 2. Seams (Aluminum): Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
 - 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 - 5. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
 - 6. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
 - 7. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
 - B. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.
- D. SHEET METAL FABRICATIONS
 - 1. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements.

2.9 ALUMINUM FINISH

- A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.

- B. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
 - 1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
 - a. Color(s): As selected by the Architect from manufacturer's available full range of colors including custom colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence.
- B. Verify that substrates and openings are rigidly set, at proper lines and elevation, properly sized, and ready to receive units.
- C. Do not proceed with installation until conditions detrimental to proper installation have been corrected.
- D. Coordinate installation with roofing work and other adjacent elements of building envelope to ensure watertight construction.

3.2 PREPARATION

- A. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- B. Isolate all dissimilar metals by means of a heavy bituminous coating, approved paint coating, adhered polyethylene sheet, or other means recommended by SMACNA.

3.3 INSTALLATION

- A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion in metal units. Set units true to line and level indicated. Install work with laps, joints, and seams permanently weatherproof and watertight.
- B. Sealed Joints: Form minimum 1-inch hooked joints and embed flange into sealant or adhesive. Form metal to completely conceal sealant or adhesive.
 - 1. Use joint adhesive for nonmoving joints specified not to be soldered.
 - 2. Moving Joints: When ambient temperature is moderate (40-70°F) at time of installation, set joined members for 50% movement either way. Adjust setting position of joined

members proportionally for temperatures above 70°F. Do not install sealant at temperatures below 40°F. Refer to section on sealants elsewhere in Division 7 for handling and installation requirements for joint sealers.

- C. Workmanship: Install sheet metal work with lines, arises, and angles sharp and true. Exposed surfaces shall be free from visible waive, warp, buckle, and tool marks. Exposed edges shall be folded back neatly to form a ½-inch hem on the concealed side. Sheet metal exposed to the weather shall be watertight with provisions for expansion and contraction.
- D. Nailing: Nailing of sheet metal shall be confined generally to sheet metal having a maximum width of 18 inches. Nailing of flashings shall be confined to one edge only. Nails shall be evenly spaced not over 3 inches on centers and approximately ½-inch from edge unless otherwise specified or indicated. Face nailing will not be permitted. Where sheet metal is applied to other than wood surfaces, detailed shop drawings shall include locations for sleepers and nailing strips required to properly secure the work.
- E. Cleats: Provide cleats for sheet metal 18 inches and over in width. Space cleats evenly not over 12 inches on centers unless otherwise specified or indicated. Unless otherwise specified, cleats shall be not less than 2 inches wide by 3 inches long, and of the same material and thickness as the sheet metal being installed. One end of the cleat shall be secured with two nails and the cleat folded back over the nailheads. The other end shall be folded back over the nailheads. The other end shall be locked into the seam. Cleats for soldered seams shall be pretinned.
- F. Bolts, Rivets and Screws: Install bolts, rivets, and screws where indicated or required. Provide compatible washers where required to protect surface of sheet metal and to provide a watertight connection.
- G. Seams; General: Comply with SMACNA, Figures 3-2 & 3-3, Tables 2-1 & 3-1R, and other applicable designs to specific installation.
 - 1. Seams: straight and uniform in width and height with no solder showing on the face.
 - 2. Flat-lock Seams for All Non-Moving Seams; Finish not less than ¾-inch wide.
 - 3. Loose-lock Expansion Seams: Not less than 3 inches wide, and shall provide minimum one-inch movement within the joint. Joint shall be completely filled with the specified sealant, applied at no less than 1/8 inch thick bed. Sealants are specified in Section 07900 - Joint Sealer Assemblies and shall be completely concealed.
 - 4. Flat Seams: Make seams in the direction of the flow.
- H. Soldering, Welding, and Mechanical Fastening: Where soldering is specified herein, it shall apply to copper and lead coated copper and galvanized metal items.
 - 1. Soldering: Cretin edges of sheet metals, except lead coated material, before soldering is begun. Soldering shall be done slowly with well heated soldering irons, so as to thoroughly heat the seams and completely sweat the solder through the full width of the seam. Edges of lead-coated material to be soldered shall be scraped or wire-brushes to produce a bright surface, and seams shall have a liberal amount of flux brushed in before soldering is begun.

- I. Aluminum Gutters and Leaders Systems: Install in longest sections available and to allow for expansion and contraction.
 1. Where metal cannot be welded, joints in gutters shall be lapped 1", riveted 2" o.c. and stripped-in with EPDM Peel and Stick Type membrane.

3.4 PROTECTION FROM CONTACT OF DISSIMILAR MATERIAL

- A. Copper or Copper-Bearing Alloys: Surfaces in contact with dissimilar metal shall be painted with heavy bodied bituminous paint, or shall be separated by means of moisture-proof building felts.
- B. Aluminum: Surfaces shall not contact other metals except stainless steel, zinc, or zinc coating. Where aluminum contacts another metal, the dissimilar metal shall be painted with a primer followed by two coats of aluminum paint.
- C. All Metal: Surfaces in contact with mortar, concrete, or other masonry materials shall be painted with alkali-resistant coatings such as heavy-bodied bituminous paint.
- D. Wood or Other Absorptive Materials: Surfaces that may become repeatedly wet and in contact with metal shall be painted with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.
- E. Dissimilar Metal: Paint with a non-lead pigmented paint if drainage from it passes over aluminum.
- F. All fasteners shall be compatible with the metal with which it is connected.

3.5 PROTECTION OF ROOFING

- A. Protection of Applied Insulation: Completely cover each day's installation with finished roofing specified. Protect open spaces between insulation and parapets or other walls and spaces at curbs, scuttles, and expansion joints, until permanent roofing and flashing is applied. Storing, walking, wheeling, or trucking will not be permitted directly on insulation or on roofed surfaces. Provide smooth, clean board or plank walkways, runways, and platforms near supports, as necessary to distribute weight to conform to indicated live load limits of roof construction.
- B. Upon completion of roofing work (including associated work) Installer shall advise Contractor of recommended procedures for surveillance and protection of roofing during remainder of construction period. At end of construction period, or at a time when remaining construction work will in no way affect or endanger roofing (at Contractor's option), Installer shall make a final inspection of roofing and prepare a written report to Contractor with copy to Owner) describing nature and extend of deterioration or damage found in the work.
- C. Installer shall repair or replace (as required) deteriorated or defective work found at time of final inspection. Installer shall be engaged by Contractor to repair damages to roofing which occurred subsequent to roofing installation and prior to final inspection.
- D. Repair or replace the roofing and associated work to a condition free of damage and deterioration at time of substantial completion.

3.6 CLEAN-UP

- A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.
- B. Upon completion of the specified work, remove all waste, debris, unused material and equipment from the site. Remove all misplaced material from nearby surfaces. Leave the job in a clean condition, acceptable to Owner.
- C. Advise Contractors of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07600

SECTION 07900 - JOINT SEALER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Part 1 through Part 6 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealant assemblies for the following applications which include performances of materials, installation requirements, as indicated herein in this specification and as specified by cross references in other Parts 1 through 6 specification sections.
- B. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:
 - 1. Control and expansion joints in cast-in-place concrete.
 - 2. Control and expansion joints in unit masonry.
 - 3. Joints between different materials.
 - 4. Perimeter joints between materials listed above and frames of doors, windows and storefront systems, as applicable.
 - 5. Other joints, as indicated.
- C. Exterior joints in the following horizontal traffic surfaces:
 - 1. Control, expansion, and isolation joints in cast-in-place concrete slabs.
 - 2. Joints between different materials.
 - 3. Other joints as indicated.
- D. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - 1. Control and expansion joints on exposed interior surfaces of exterior walls.
 - 2. Perimeter joints of exterior openings, where indicated.
 - 3. Vertical control joints on exposed surfaces of interior unit masonry walls and partitions.
 - a. Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefront systems.
 - b. Other joints, as indicated.
 - 4. Interior joints in the following horizontal traffic surfaces:
 - a. Control and expansion joints in cast-in-place concrete slabs.
 - b. Other joints, as indicated.

- E. Preparation of all joints to be sealed.
- F. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
 - 1. Cutting out as needed to give proper depth.
 - 2. Installation of proper back up material for each joint.
 - 3. Cleaning to remove all dust, dirt, oil films, loose material etc.
 - 4. Masking of adjacent surfaces.
 - 5. Priming of joint surfaces.

1.3 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Where fire rated joint assemblies are indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with the following requirements, tested by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.
 - 1. Fire Testing: ASTM E 119/UL 263.
 - 2. Surface Burning Characteristics: ASTM E84/UL 723.
 - a. Flame Spread: 15
 - b. Smoke Developed: 0
 - 3. Through - Penetration Firestopping: ASTM E814/UL 1479.
 - 4. Fire Resistance of Building Joint Systems: UL 2079
- B. VOC Content of Interior Sealants and Sealant Primers: Comply with the following limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Sealants: Not more than 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: Not more than 250 g/L.
 - 3. Sealant Primers for Porous Substrates: Not more than 775 g/L.
- C. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
 - 1. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
 - 2. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - a. Use manufacturers standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - b. Testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

- c. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:
 - (1) Locate test joints where indicated or, if not indicated, as directed by Architect.
 - (2) Conduct field tests for each application indicated below:
 - (a) Each type of elastomeric sealant and joint substrate indicated.
 - (b) Each type of nonelastomeric sealant and joint substrate indicated.
 - (3) Notify Architect seven days in advance of dates and times when test joints will be erected.
 - (4) Sealant Manufacturer Responsibility:
 - (a) Manufacturer shall provide Technical Representative to perform Sealant Joint Field Pull Test. Manufacturer Sales representative is not acceptable to perform Field Pull Test.
 - (b) Technical Representative performing Field Pull Test must be an employee of the Sealant Manufacturer. Outside Sales Agent or Contract Technical Representative is not acceptable to perform Field Pull Test.
 - (5) Test Method: Test joint sealants by hand-pull method described below:
 - (a) Install joint sealants in 60-inch long joints using same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
 - (b) Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2-inch piece.
 - (c) Use fingers to grasp 2-inch piece of sealant between cross-cut end and 1-inch mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
 - (d) For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
 - (6) Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 - (7) Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
- 3. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution:
 - a. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

- b. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

4. PROJECT CONDITIONS

- a. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
 - When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
 - (2) When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40°F.
 - (3) When joint substrates are wet.
- b. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- c. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

D. Special Project Warranty and Guarantee:

- 1. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - a. Warranty Period: **Five (5) years** from approved date of Substantial Completion.
- 2. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - a. Warranty Period: **Five (5) years** from approved date of Substantial Completion.
- 3. Guarantee shall further state that all exterior sealant will be guaranteed against:
 - a. Adhesive or cohesive failure in joints where movement is under maximum 25% extension or compression.
 - b. Any crazing greater than 3 mils in depth developing on surface of material.

1.4 SUBMITTALS

- A. Product Data from manufacturers for each joint sealer product required, including instructions for joint preparation and joint sealer application, include color samples showing full range of colors available, for each product exposed to view.
 - 1. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.

- B. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
 - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40°F (4.4°C).
 - 3. When joint substrates are wet due to rain, frost, condensation, or other causes.
- B. Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are less than allowed by joint sealer manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Architect from manufacturer's available full range of standard and optional colors.
- C. Grade of Sealant: For each application, provide the grade of sealant (nonsag, self-leveling, no track, knife grade, etc.) as recommended by the manufacturer for the particular condition of installation (location, joint shape, ambient temperature, and similar conditions) to achieve the best possible overall performance. Grades specified herein are for normal condition of installation.

2.2 MISCELLANEOUS MATERIALS

- A. Joint Primer/Sealer: Provide the type of joint primer/sealer recommended by the sealant manufacturer of the joint surfaces to be primed or sealed.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- C. Sealant Backer Rod: Provide materials which are in compliance with ASTM D 1056; compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer.
 - 1. Materials shall be capable of remaining resilient at temperatures down to minus 26°F.
- D. Joint Fillers:
 - 1. Joint Fillers for Concrete Slab on Grade: Provide "Fiber", as manufactured by WR. Meadows Sealtight Ceramar; or approved equal.
 - a. Nonextruding bituminous type: ASTM D 1751.
 - 2. Joint Fillers for Interior Concrete Slabs: Provide "Ceramar" flexible foam expansion joint, as manufactured by W.R. Meadows, Inc., Tel.# 800.342.5976, www.wrmeadows.com; or approved equal.
 - a. Flexible foam expansion joint filler composed of a unique synthetic foam of isomeric polymers in a very small, closed-cell structure. Gray in color, Ceramar is a lightweight, flexible, highly resilient material offering recovery qualities of over 99%. The compact, closed-cell structure will absorb almost no water.
 - b. Non-impregnated and will not stain or bleed.
 - c. Non-gassing.
 - d. Complies with:
 - (1) ASTM D 5249, Type 2,
 - (2) ASTM D 1752, Sections 5.1 - 5.4, with compression requirement modified to 10 psi minimum and 25 psi maximum,
 - (3) ASTM D 7174-05.

2.3 SEALANTS

- A. **Sealant Type 1:** For all control and expansion joints in concrete sidewalks and slabs on grade, two-part, self leveling polyurethane traffic grade sealant, complying with, and ASTM C 920 and ASTM D 1850.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "NR-200 Urexpan"; Pecora Corporation.
 - b. "THC 900/901"; Tremco, an RPM Co.
 - c. "Sikaflex-2c SL"; Sika Corporation.
 - d. Or approved equal.

2. Color to be selected by the Architect.
- B. **Sealant Type 2:** For sealing exterior joints, provide a Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Spectrum 1 / Spectrum 800"; Tremco, an RPM Co.
 - b. "SikaSil - WS290"; Sika Corporation
 - c. "Dowsil 790 Silicone Building Sealant"; Dow Corning Corporation
 - d. Or approved equal.
- C. **Sealant Type 5:** For all interior joints between drywall partitions, CMU walls, hollow metal framing, cabinet heater, other metal mechanical or electrical assemblies, (sealant work performed by other trades and cross-referenced to the work of this section), etc., where all adjacent surfaces will receive paint:
1. Latex Sealant: Non-elastomeric, one part, non-sag, paintable latex sealant recommended for exposed joints applications, complying with ASTM C 834, Type P (opaque sealants), Grade NF.
 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. "AC-20 Plus Silicone"; Pecora Corporation.
 - b. "Tremflex 834"; Tremco, an RPM Co.
 - c. "Sonolastic Sonolac"; Sonneborn Building Products Div., ChemRex, Inc.
 - d. Or approved equal.

2.4 FIRE RATED JOINTS

- A. Construction fire rated joint assemblies shall meet indicated fire rating performance requirements. Provide assemblies where required and as indicated on the drawings with the following components:
1. Joint Filler: Subject to compliance with indicated requirements, provide one of the following:
 - a. "Ultra Block", as manufactured by Backer Rod Manufacturing,
 - b. "Cerablanket"; Tremco,
 - c. ThermaFiber
 - d. Or approved equal.
 - e. Provide fire rated joint filler in thickness and shape as required to fill joints.
 2. Joint Sealant: Subject to compliance with requirements, provide one of the following:
 - a. "Dynatrol II"; Pecora Corporation.
 - b. "Tremstop Acrylic"; Tremco, Inc, or "Trimstop IA, Intumescent Acrylic, Tremco, Inc.
 - c. "Sikaflex-2c NS"; Sika Corporation.
 - d. Or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealers, with Installer present, compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
- B. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellants; water; surface dirt; and frost.
- C. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
- D. Remove laitance and form release agents from concrete.
- E. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- F. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.
- G. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which 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.
- H. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of joint fillers.
 - 2. Do not stretch, twist, puncture, or tear joint fillers.
 - 3. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.

- I. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
- J. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.
- K. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

3.3 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

END OF SECTION 07900

SECTION 08110 - HOLLOW METALWORK

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 DESCRIPTION OF WORK

- A. Extent of hollow metalwork for frames and transoms windows are indicated and scheduled on the drawings.
- B. Related Sections:
 - 1. Section 01030 - Alternate Bids
 - 2. Section 04200 - Masonry Work.
 - 3. Section 08211 - Wood Doors.
 - 4. Section 08700 - Finish Hardware.
 - 5. Section 08800 - Glass & Glazing.
 - 6. Section 08870 - Security Window Film.
 - 7. Section 08871 - Security Glazing (Alternate Bid).
 - 8. Section 09250 - Gypsum Drywall
 - 9. Section 09900 - Painting.

1.3 QUALITY ASSURANCE

- A. Provide frames complying with the following:
 - 1. Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.
 - 2. American National Standard Institute:
 - a. ANSI Standards A156 Series for Hardware.
 - b. ANSI A115 Steel Door Preparation Standards.
- B. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated frame assemblies that have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction, (i.e., UL, Warnock Hersey).

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.
- B. Shop Drawings: Submit for fabrication and installation of steel frames. Include details of each frame type, conditions at openings, details of construction, location and installation

requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1. Provide schedule of frames using same reference numbers for details and openings as those on contract drawings.
- C. Samples: Full range of color samples for Architect selection; 2 samples, 6" square min., of each color and texture as selected for factory-finished frames.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Before shipping, label each frame with metal or plastic tags to show its location, size, and other pertinent information. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage.
- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering steel frames which may be incorporated in the work include; but are not limited to, the following:
 1. Steelcraft/Div. American Standard Co.
 2. Republic Builders Products Corp./Subs. Republic Steel.
 3. Curries Company, Mason City, Iowa
 4. Or approved equal.

2.2 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A1008 and ASTM A 568.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, with ASTM A 525, G60 zinc coating, mill phosphatized.
- D. Supports and Anchors: Fabricate of not less than 18-gauge galvanized sheet steel.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

F. Shop Applied Paint:

1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, capable of passing a 100 hours salt spray and 250 hours humidity test in accordance with ASTM test methods B 117 and D 3322 and shall be suitable as a base for specified finish paints indicated in specification section 09900.

2.3 ACCESSORIES

- A. Inserts: For required anchorage into concrete work, furnish inserts of cast iron, malleable iron or 12 gauge steel hot-dip galvanized after fabrication.
- B. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled in, expansion bolt anchors.

2.4 FABRICATION, GENERAL

- A. Fabricate frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.
- B. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).
- C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
- D. Finish Hardware Preparation: Prepare frames to receive finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.
- E. Reinforce frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.
- F. Locate finish hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute.

2.5 STANDARD STEEL FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, transom windows and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated.
 1. Fabricate frames of minimum 16-gauge cold-rolled furniture steel at interior locations and 14 gauge galvanized cold-rolled furniture steel at exterior locations.
 2. Fabricate frames with mitered and welded corners, unless indicated otherwise.

B. Hardware reinforcing shall be as follows:

1. All frames are to be mortised reinforced, drilled and tapped in factory for all template mortise hardware, in accordance with "Approved" Finish Hardware Schedule and templates as provided by the Hardware Supplier. Where surface mounted hardware is to be applied, all frames shall have reinforcing plates.
2. Reinforcement plates shall be as follows:
 - a. Hinge Preps:
 - 1) Masonry: For "F" Series: 7 gauge, minimum.
 - 2) Metal Stud/Drywall: For "DW" Series: 7 gauge, minimum.
 - b. Strike Preps:
 - 1) Masonry: For "F" Series: 12 gauge, minimum.
 - 2) Metal Stud/Drywall: For "DW" Series: 12 gauge, minimum.
 - c. Closure Reinforcement: All Series - 12 gauge, minimum.
 - d. Surface mounted hardware: All Series - 12 gauge, minimum.
3. Base anchors for frames to be installed in masonry and drywall wall and partition assemblies, shall be adjustable type, shipped loose and to be 14 gauge, minimum.
4. Jamb Anchors:
 - a. For "F" Series frames in masonry walls provide adjustable wire type anchors (0.156" dia.), or strap type anchors (16 gauge), and "DW" Series frames in metal stud / drywall walls field adjustable compression anchors, provide quantities as follows:
 - 1) Frames up to 7'-6" in height: 3 per jamb.
 - 2) Frames over 7'-6" to 12'-0" in height: 4 per jamb.
 - 3) and one (1) adjustable base anchor per jamb.
 - b. At existing masonry wall opening to remain, provide "Butterfly Existing Wall Anchors", 18 gauge galvanized steel, provide quantities as follows:
 - 1) Frames up to 7'-6" in height: 3 per jamb.
 - 2) Frames over 7'-6" to 12'-0" in height: 4 per jamb.
 - 3) and one (1) adjustable base anchor per jamb.
5. Reinforce heads and jambs where indicated on drawings with 10 gauge channel, continuously welded to frame.

2.6 TRANSACTION WINDOW COMPONENTS

- A. Frame: Hollow metal.
- B. Speak Hole: Basis of Design - "#410", as manufactured by Nissen & Co.; or approved equal.
- C. Counter: Material: 14 gauge (.074) - 304 Stainless Steel with a #4 Fine Brush Finish.

- D. Glazing: Refer to Door Schedule and Section 08800.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install standard steel frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames", unless otherwise indicated.
- C. **Place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position so that the head and jambs of the frame are square, plumb, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.**
- D. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.
- E. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.
- F. Install fire-rated frames in accordance with NFPA Std. No. 80.
- G. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels, or as indicated. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws. Use indicated anchors and as per manufacturer's recommendations.

3.2 ADJUST AND CLEAN

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Check and re-adjust operating Finish Hardware items, without causing any damage to frames. Provide complete work for frames, leave clean and in proper operating conditions.

END OF SECTION 08110

SECTION 08211 - WOOD DOORS

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.
- B. Related Sections:
 - 1. Section 01030 - Alternate Bids
 - 2. Section 01800 - Time of Completion and Liquidated Damages
 - 3. Section 04200 - Unit Masonry
 - 4. Section 08110 - Hollow Metalwork
 - 5. Section 08700 - Finish Hardware
 - 6. Section 08800 - Glass and Glazing
 - 7. Section 08870 - Security Window Film
 - 8. Section 09250 - Gypsum Drywall
 - 9. Section 09900 - Field Painting of metal lites

1.2 SUMMARY

- A. Extent and location of each type of flush wood door is indicated on drawings and in the door schedule.
- B. Construction: Five plies with stiles and rails bonded to core, then entire unit abrasive plained before veneering. Assembly of face veneer and crossband to core in accordance with WDMA.
 - 1. Solid core wood doors with solid hardwood edging.
 - 2. Solid core 20 min. labeled flush wood doors with solid hardwood edging.
 - 3. Mineral core 45, 60, and 90 min. labeled flush wood doors with hardwood edging.
- C. Shop-priming of wood doors is included in this Section.
- D. Factory-finishing of wood doors is included in this Section.
- E. Factory-prefitting to frames and factory-premachining for hardware for wood doors is included in this Section.

1.3 QUALITY ASSURANCE

- A. Construction per WDMA I.S. 1A - 11.
- B. Fire-Rated Wood Doors: Provide wood doors which are identical in materials and construction to units tested in door and frame assemblies per ASTM 2074-00 Fire Test (Category A Positive Pressure). For mineral core doors, provide composite blocking with improved screw holding capability as needed to eliminate through-bolting of hardware. They are to be labeled and listed for ratings indicated by UL, Warnock Hersey or other testing and inspection agency acceptable to authorities having jurisdiction. Fire labels shall be affixed at

the factory of the door manufacturer, and shall be from the Underwriter's or Warnock Hersey Testing Laboratories. Each label shall show the testing time of the label, and no approval will be given to "Construction Type" labels.

1. All "Category A" doors shall have concealed intumescent seals.
- C. Door Construction Field Examination: Upon direction of the Architect, the Contractor may be instructed to destroy a randomly selected wood door or panel by sawing it in half, vertically and horizontally, to verify conformance of the contract requirements. If the door(s) do not meet the specifications, all of the doors delivered for the project will be rejected, and the doors shall be replaced at the Contractor' expense. Further door inspection, to insure conformity to specifications, shall also be at the expense of the Contractor.
1. All such delays as a result of the fabrication and delivery of non-compliant doors which vary from the processed shop drawing submittal will be the responsibility of the Contractor (refer to Section 01800 for Liquidated Damages).

1.4 REFERENCE STANDARDS

- A. Comply with the applicable requirements of the following standards unless otherwise indicated.
1. Window & Door Manufacturers Association (WDMA)
 - a. I.S. 1A - 11 Architectural Wood Flush Doors (WDMA).
 - b. Standard Procedures and Recommendations for Factory Machining Flush Wood Doors for Hardware.
 2. American National Standards Institute
 - a. ANSI A115. W Series, Wood Door Hardware Standards.
 3. Underwriter's Laboratories, Inc. (UL)
 - a. UL 10C Fire Test
 4. American Society for Testing and Materials:
 - a. ASTM 2074-00 (Category A Positive Pressure) Fire Tests of Door Assemblies.

1.5 SUBMITTALS

- A. **The shop drawing submittal will not be reviewed by the Architect unless a complete shop drawing submittal (technical data, details of core and edge construction, location and extent of hardware blocking, fire ratings, factory finish samples, 8" x 10" minimum for finish and 4" x 5" minimum for construction assembly) are made as one complete submittal, by the Contractor, and will be returned to the Contractor if incomplete.**
1. **Subsequent delays as a result of an incomplete submittal will be the responsibility of the Contractor (refer to Section 01800 for Liquidated Damages).**
- B. Product Data: Door manufacturer's technical data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.

1. Include certifications as may be required to show compliance with specifications.
 2. **The door manufacturer's shop drawing literature which may include language for the substitution of door construction at the option of the manufacturer is not permitted. Doors which are switched will be rejected and all costs associated with the manufacturing of the door type(s) specified will be by the Contractor/Manufacturer.**
- C. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.
1. For factory-premachined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light openings.
- E. Samples: Submit samples, 8" x 10" minimum for finish and 4" x 5" minimum for construction assembly, for the following:
1. Doors for Transparent Finish: Flat samples illustrating finish and color of wood grain for each species of veneer and solid hardwood lumber required.
 2. Factory-Finished Doors: Each type of factory finish required.
 3. Metal Frames for Light Openings: Manufacturers product samples or product cut sheets for light frames and color selector guide for each material and finish required.
- F. Warranties and Certification Markings: Furnish with shop drawings:
1. Door supplier must attest, in writing addressed to Architect, that the order has been placed in conformance with specification requirements in all respects.
 2. All doors shall carry a "Lifetime" guarantee, including rehang and finish for all door(s) which do not comply with the manufacturer's warranty.
 3. Copy of Warranty shall be given to the Architect and Owner prior to the completion of the project.
 4. All doors shall be factory marked, on the top of the door, showing the order number, item number on the order, size of finished door, material, and core construction, for future information should replacement of the door be necessary.
- G. The Wood Door Supplier shall provide a letter indicating all of the following:
1. The wood door supplier has completely reviewed the contract documents (drawings, specifications and addenda) and has worked with the distributor in the preparation and submission of a complete shop drawing submittal to the Architect.
 2. The wood door supplier shall attest that the order has been placed in accordance with the contract document drawings, specifications and addenda,
 3. The wood doors ordered and delivered to the job site are in conformance with the requirements of the job and per the approved shop drawings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations in WDMA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as with manufacturer's instructions.
- B. Protect all doors from damage and moisture under cover. Use wood blocking under horizontally stored doors. At no time will doors be allowed to come in contact with floor or water.
 - 1. The location where the doors are being stored on the job site shall be between 25 - 55% relative humidity. The Contractor shall forward independent certified testing that confirms compliance.
- C. All doors not finished at factory must be sealed on all surfaces within one (1) week after arrival at jobsite.
- D. Remove all damaged doors from jobsite prior to completion of project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Provide "Aspiro™ Series I Marshfield-Algoma™" wood doors as manufactured by Masonite Architectural, Tel.#877.332.4484, www.masonitearchitectural.com; or approved equal.
 - 1. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.
 - 2. Comparable products from other manufacturers will be considered if it can be clearly shown that their products are tested, equal to or will exceed the construction quality requirements, intended performances and all other design attributes listed above and provided that deviations in dimensions and profiles are minor and do not materially detract from the design concept or intended performances as judged solely by the Architect.
 - a. Eggers Industries; Architectural Flush Doors Division, Tel.# 920.722.6444, www.eggersindustries.com.
 - b. VT Industries, Architectural Wood Doors, Tel.# 800.827.1615, www.vtindustries.com/doors.
 - c. Graham Wood Doors, Tel.# 641.423.2444, www.grahamdoors.com.
 - d. Or approved equal.

3. The use of one manufacturer's catalog numbers, and the specific requirements set forth in drawings and specifications are not intended to preclude the use of other manufacturer's products or procedures which may be equivalent, but are given for the purpose of establishing a standard of design and quality for materials, construction and workmanship.
4. **Substitutions: Substitution of products will only be considered when the Contractor/Door Supplier have submitted, to the Architect, all appropriate documents and in the time frame as outlined in the requirements indicated in Specification Section 00800.**

2.2 MATERIALS AND COMPONENTS

- A. General: Provide wood doors complying with applicable requirements of referenced standards for kinds and types of doors indicated and as specified.
- B. Solid Core Doors for Transparent Finish: Comply with the following requirements:
 1. Faces: Veneer leaves shall be Slip Match and veneers assembled in Running Match, Grade 'A', plain sliced red oak for transparent finish; CS-171, Type II.
 - a. **At existing buildings, provide veneer faces to match the species of the existing veneer or as directed by the Architect.**
 2. Construction: Premium Construction Grade, SCLC-5 Bonded (5-ply, with no added urea-formaldehyde glues).
- C. Edges
 1. Vertical stiles of same species to the face veneer, with a minimum of 1/4 inch solid hardwood after trimming.
 - a. Manufacturers standard construction with hardwood outer.
- D. Core: Structural Composite Lumber Core consisting of an engineered wood product that is made by fusing a network of wood strands together with a water-resistant adhesive to produce a strong, solid and stable product that has true structural properties with excellent screw holding properties and very high split resistance.
 1. Core Edge Interface: Vertical and horizontal edges of solid core doors must be securely bonded to the core with waterproof glue containing no added urea formaldehyde resin.
- E. Fire-Rated Solid Core Doors
 1. Faces and WDMA Grade: Provide species and grade to match non-rated doors in same area of building, unless otherwise indicated.
 2. Core Construction
 - a. 20 Min. Doors: Single Leaf - Same Structural Composite Lumber Core as noted above.

3. Edge Construction

- a. 20 Min. Doors: Single Leaf - Same Structural Composite Lumber edge construction noted above.
- b. All "Category A" doors shall have concealed intumescent seals.

F. Glazing of Wood Doors:

1. Glazing shall be by the wood door manufacturer.
2. Glass shall be in accordance with requirements of Section 08800.

2.3 LITE FRAMES

A. Metal Lite Frames:

1. Standard Metal Vision Frames:

- a. Basis of Design: Model "LoPro™" as manufactured by Anemostat Door Products, San Antonio, TX; Tel.# 210.662.6300; or approved equal.
- b. Material: 20 ga. (1mm) Cold Rolled Steel.
- c. Finish: Grey Primer, Beige or Bronze Baked Enamel.
- d. Glazing: Should be 1/4" (6mm), 3/16" (5mm) or 5/16" (8mm) fire and/or safety rated with U.L. and/or W.H.I classification markings. Nominal glazing space of 3/8" (10mm) allows for glazing tape to be used on both sides of the glass.
- e. Fire Ratings with U.L. & W.H.I Classification markings:
 - 1) 20* Minute: Approved listing at 3204 sq.in. visible lite, max. width 36", max. height 89".

Note: *Must be used with Firelite Plus or NT and fire listed glazing tape, or another manufacturer's equivalent product. Glazing combination must be used in appropriately tested door assembly.

- f. **Refer to Section 08870 - Security Window Film pertaining to the application of the film on the glazing and lite frame.**

2.4 GENERAL FABRICATION REQUIREMENTS

- A. Fabricate wood doors to produce doors complying with following requirements:
- B. In sizes indicated for job-site fitting.
- C. Factory-prefit and premachine doors to fit frame opening sizes indicated with the following uniform clearances and bevels:
 1. Comply with tolerance requirements of WDMA for prefitting. Comply with final hardware schedules and door frame shop drawings and with hardware templates.

2. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.
 3. Pre-fit and pre-machine wood doors at factory. Machining shall be in accordance with necessary templates supplied by the Builders Hardware supplier, in accordance with the approved Finish Hardware Schedule for this project. Each door shall be machined for all necessary mortise hardware (ie, locks, hinges, closers, etc.) but face or thru bolt holes shall be done in the field, if such machining is not called for on templates, or is not normally machined at factory. No field preparation will be allowed.
 4. Sizing of single doors to be undersized for nominal 1/4 inch, with edges beveled on two edges, as required by the frame manufacturer.
 5. Door clearances are to be 1/8 inch at top and the bottom shall be a maximum of 1/2 inch, or as required by job condition or labeling requirements.
- D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of doors required.
- E. Factory Finish and Uniform Range of Veneers
1. Prefinish wood doors at factory only.
 2. All face veneer shall have uniform range of colors, as specified by Architect, in selection of the range of color of the veneer.
 3. Comply with recommendations of WDMA for factory finishing of doors, including final sanding, immediately before application of finishing materials.
 4. Provide finish WDMA, #TR-6, transparent water-based stain and ultraviolet (UV) cured water based polyurethane sealer and topcoat material, color as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install doors using finish hardware in accordance with approved hardware schedule. Protect doors from damage until completion of Project. Except where through bolting is required to meet Code for "A" or "B" label doors, install surface applied hardware on metal or wood doors using all thread screws inserted in pilot drilled holes filled with white acrylic glue.
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's printed instructions and of referenced WDMA standard and indicated in the printed instructions provided by the manufacturer.
- C. Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80.
- D. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors.

1. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- E. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
- F. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
1. Bevel non-rated doors 1/8" in 2" at lock and hinge edges.
 2. Bevel fire-rated doors 1/8" in 2" in lock edge; trim stiles and rails only to extent permitted by labeling agency.
 3. Prefit Doors: Fit to frames for uniform clearance at each edge.
- G. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at the job site.
- H. Manufacturer of wood doors shall install glass in wood doors.

3.2 ADJUSTING AND PROTECTION

- A. Operation: Rehang or replace doors which do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
1. Protect doors, as recommended by door manufacturer, to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 08211

SECTION 08305 - ACCESS DOORS

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. Section Includes:
 - 1. Wall access doors.
 - 2. Fire-rated wall access doors.
 - 3. Ceiling access doors.
 - 4. Fire-rated ceiling access doors.
- B. Types of construction in which access doors are installed include:
 - 1. Masonry.
 - 2. Gypsum board.
- C. Exact locations and sizes of access doors may not be indicated on the drawings. Obtain specific locations and sizes for access doors from trades requiring access to concealed equipment.
- D. Products Furnished and Installed under This Section:
 - 1. Installation of anchors for access doors placed in masonry: Division 4.
- E. Related Sections:
 - 1. Painting of access doors: Section 09900.
 - 2. General requirements for access doors: Mechanical Work Sections.
 - 3. General requirements for access doors: Electrical Work Sections.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.
 - 1. Include complete schedule, including types, general locations, sizes, wall, floor and ceiling construction details, finishes, latching or locking provisions, and other data pertinent to installation.
- B. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.

- C. Special Size Access Doors: Use where required or requested; indicate on schedule.
- D. Shop Drawings: Submit shop drawings for fabrication and installation of customized access doors and frames, including details of each frame type, elevations of door design types, anchorage and accessory items.
- E. Samples: 3" x 5" minimum size, of each panel face material showing factory-finished color and texture.

1.4 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in Underwriters Laboratories, Inc.; "Building Materials Directory" for rating shown.
 - 1. Attach UL Label on each fire-rated access door.
 - 2. For fire-rated ceiling access doors, provide door assembly from manufacturer whose products have been tested by independent testing agency acceptable to the building official and have been found acceptable for fire ratings indicated.
 - a. Provide testing agency label on each fire-rated access door.
- B. Test Reports: Submit manufacturer's test reports which demonstrate that products comply with required fire ratings.
- C. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units which are different than actual opening size necessary for access.
- D. Coordination: Furnish inserts and anchoring devices which must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering access doors which may be incorporated in the work include, but are not limited to, the following:
 - 1. Bilco Company.
 - 2. J. L. Industries.
 - 3. Milcor/Lima Register.
 - 4. Bar-Co., Inc.
 - 5. Syracuse Castings Sales Corp., (for Access Door Assembly #1 only).
 - 6. Or approved equal.

2.2 MANUFACTURED UNITS

A. Access Door Assembly 2:

1. Location: Wall.
2. Type: Flush door panel with exposed frame.
3. Substrate: Masonry.
4. Fire rating: 1-1/2 HR (B).
5. Frame: 16 gauge steel.
6. Door: 20 gauge steel flush panel.
7. Hinge: Continuous type hinge with stainless steel pin.
8. Locking device: Keyed cylinder lock.
9. Finish: Baked-on rust-inhibitive prime coat.

B. Access Door Assembly 3:

1. Location: Wall.
2. Type: Flush door panel with exposed frame.
3. Substrate: Masonry.
4. Frame: 16 gauge steel.
5. Doors: 14 gauge steel flush panel.
6. Hinge: Continuous type hinge with stainless steel pin.
7. Locking Device: Keyed cylinder lock.
8. Finish: Baked-on rust-inhibitive prime coat.

C. Access Door Assembly 4:

1. Location: Wall.
2. Type: Flush door panel with concealed frame.
3. Substrate: Gypsum board.
4. Frame: 16 gage steel.
5. Door: 14 gage steel flush panel.
6. Hinge: Double-acting concealed spring hinges allowing door to open a minimum of 165 degrees.
7. Locking device: Keyed cylinder lock.
8. Finish: Baked-on rust-inhibitive prime coat.

D. Access Door Assembly 5:

1. Location: Ceiling.
2. Type: Flush door panel with concealed frame.
3. Substrate: Gypsum board.
4. Fire rating: 1 HR (B).
5. Frame: 16 gauge steel.
6. Door: 18 gauge steel recessed panel.
7. Hinge: Continuous type hinge with stainless steel pin.
8. Locking device: Keyed cylinder lock.

- E. Access Door Assembly 6:
 - 1. Location: Ceiling.
 - 2. Type: Flush door panel with concealed frame.
 - 3. Substrate: Gypsum board.
 - 4. Frame: 16 gauge steel.
 - 5. Door: 14 gauge steel flush panel.
 - 6. Hinge: Double-acting concealed spring hinges allowing door to open a minimum of 165 degrees.
 - 7. Locking device: Keyed cylinder lock.
 - 8. Finish: Baked-on rust-inhibitive prime coat.

2.3 ACCESSORIES

- A. Locking Devices:
 - 1. Where locking devices are indicated, provide one lock per access door.
 - 2. Supply four (4) keys with each lock.
 - 3. Key access door locks alike.

2.4 MATERIALS AND FABRICATION

- A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
- B. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.
- C. Frames: Fabricate from 16 gauge steel.
- D. Fabricate frame with exposed flange nominal 1" wide around perimeter of frame for units installed in the following construction:
 - 1. Exposed masonry.
 - 2. Drywall finish.
- E. For gypsum drywall, furnish perforated frames with drywall bead.
- F. For installation in masonry construction, furnish frames with adjustable metal masonry anchors.
- G. Flush Panel Doors: Fabricate from not less than 14 gauge sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees. Finish with manufacturer's factory-applied prime paint.
- H. Flush Panel Doors: Fabricate from not less than 14 gauge stainless steel sheet, with concealed spring hinges or concealed piano hinge set to open 175 degrees. Buff exposed surfaces to #4 satin finish.

- I. For fire-rated units, provide manufacturer's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.
- J. Recessed Panel Doors: Fabricate from not less than 18 gauge sheet steel with face of panel formed to provide recess below surface of applied finish. Reinforce panel as required to prevent buckling. Finish with manufacturer's factory-applied prime paint.
- K. Furnish recessed panels for concealed installation in acoustic tile ceiling systems.
- L. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.
- M. Provide one cylinder lock per access door. Furnish four (4) keys per lock. Key all locks alike, unless otherwise scheduled.
- N. Where shown or scheduled, provide one cylinder lock per access door. Furnish four (4) keys per lock. Key all locks alike, unless otherwise indicated.
- O. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Coordinate installation with work of other trades.
- C. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- D. Where the Plumbing, Mechanical, or Electrical (MEP) Prime Contractor(s) require an access door to be installed to provide access to valves, etc., the MEP Prime Contractor shall provide the access door and the General Contractor shall install the access door.

3.2 ADJUST AND CLEAN

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels or frames which are warped, bowed or otherwise damaged.

END OF SECTION 08305

SECTION 08331 - ROLLING COUNTER FIRE SHUTTER

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Electrically operated automatic closing rolling counter fire shutter.
- B. Related Sections:
 - 1. Section 04200 – Unit Masonry.
 - 2. Section 05500 - Metal Fabrications. Door opening jamb and head members.
 - 3. Section 09900 – Painting - field painting.
 - 4. Electrical Work - wiring, conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm system.
- C. Products that may be supplied, but are not installed under this Section:
 - 1. Control station
 - 2. Electrical disconnect
 - 3. Annunciators
 - 4. Primary and control wiring
 - 5. Conduit and fittings

1.2 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Provide doors with Underwriters' Laboratories, Inc. label for the fire rating classification of 1-1/2 hr.
- B. Reference AIA A201 and Section 00800 Submittal Procedures; submit the following items:
 - 1. Product Data.
 - 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. Quality Assurance/Control Submittals:
 - a. Provide proof of manufacturer ISO 9001:2008 registration.
 - b. Provide proof of manufacturer and installer qualifications - see 1.4 below.
 - c. Provide manufacturer's installation instructions.
 - 4. Closeout Submittals:
 - a. Operation and Maintenance Manual.
 - b. Certificate stating that installed materials comply with this specification.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer Qualifications: ISO 9001:2008 registered and a recommended minimum of five years' experience in producing counter fire doors units of the type specified.
 - 2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

- A. Reference AIA A201 and Section 01600 Requirements.
- B. Follow manufacturer's instructions.

1.6 WARRANTY

- A. Standard Warranty: **Two (2) years** from date of shipment against defects in material and workmanship.
- B. Maintenance: Submit for Owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer:
 - 1. Basis of Design: Model "ERC10" 1-1/2 hour fire rated Counter Fire Door with AlarmGard Tube Motor Operator, as manufactured by CornellCookson, LLC, Goodyear, AZ; Tel. # 800.294.4358.
 - 2. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include but are not limited to the following:
 - a. Clopay Building Products.
 - b. Or approved equal.

2.2 MATERIALS

- A. Curtain:
 - 1. Slat Configuration:
 - a. Stainless Steel: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, minimum 22 gauge AISI Type 304 #4 finish stainless steel with stainless steel bottom bar and vinyl astragal.
 - 2. Finish: Stainless Steel: Type 304 #4 finish
- B. Endlocks:
 - 1. Fabricate continuous interlocking slat sections with high strength galvanized steel endlocks riveted to slats per UL requirements.
- C. Guides:
 - 1. Configuration & Finish:
 - a. Steel: minimum 12 gauge formed shapes.
 - b. Stainless Steel: minimum 12 gauge formed shapes.
 - 1) Type 304 #4 finish.

- D. Counterbalance Shaft Assembly:
1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.
 2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.
- E. Brackets:
1. Fabricate from reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
 2. Finish:
 - a. Powder Coat (Stock Colors): Zirconium treatment followed by a gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.
- F. Hood and Mechanism/Tube Motor Covers:
1. 24 gauge stainless steel with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
 2. Finish: Stainless steel: type 304 #4 finish.
- G. Countertop: Integral 14 gauge AISI 300 series stainless steel formed shape; No. 4 finish.

2.3 OPERATION

- A. AlarmGard Advanced Tube Motor Operation:
1. AlarmGard Series Electric Tube Motor: UL, cUL listed NEMA 1 enclosure, 115v/ 60 Hz/ single phase service. Provide a totally enclosed non-ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.
 - a. Provide a failsafe tubular motor operated fire shutter assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms.
 - b. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.
 - c. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.
 - d. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices.
 - e. Electrically activate door system automatic closure by notification from central alarm system or power outage.
 - f. Maintain automatic closure speed at not more than 12" (229 mm) per second.

- g. Enable safety edge function during alarm gravity closing while power is present. Enable door to rest upon obstruction following this sequence.
 - h. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human supervision.
 - i. Provide selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human supervision.
 - j. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.
 - k. Notify electrical contractor to mount control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.
 - l. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5.
- B. Control Station: Surface mounted: "Open/Close/Stop" push buttons; NEMA 1
- C. Control Operation:
- 1. Momentary contact to close: Fail-safe, UL325-2010 Compliant Entrapment Protection for Motor Operation.
 - a. Continuously monitored, wireless sensing seal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position.

2.4 ACCESSORIES

- A. Locking: None.
- B. Stainless Steel, min. 14 gauge type 304 #4 finish: ¾ Hour UL Labeled, 2" (51 mm) thick, 14 gauge type 304 #4 finish stainless steel. "T" shaped design for face of wall mounted unit of size and configuration for opening size and wall construction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

- A. Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Comply with NFPA 80 and follow manufacturer's installation instructions.

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 FIELD QUALITY CONTROL

- A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

3.5 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.6 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION 08331

SECTION 08410 - FIBERGLASS REINFORCED POLYESTER (FRP) DOORS

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 DESCRIPTION OF WORK

- A. The contractor shall furnish all labor, tools, equipment, and services required to install new doors, hardware, glazing, etc. In general, the work under this section includes the following:
 - 1. The removal of all necessary portions of existing doors, hardware and related entrance material to permit the installation of new material as specified hereafter. Material removed shall be disposed of by contractor or salvaged as directed by the architect.
 - 2. The furnishing and installation of doors, hardware, glazing and caulking as required for a complete installation including all necessary cleaning and adjustments.
- B. The following types of doors, and accessories are required:
 - 1. Fiberglass Reinforced Polyester/Aluminum Hybrid (FRP) Doors.
 - 2. Glazing
 - 3. Hardware
 - 4. Caulking
- C. Related Sections
 - 1. Section 07900 - Joint Sealer Assemblies
 - 2. Section 08415 - Aluminum - Framed Entrances and Storefront System
 - 3. Section 08700 - Finish Hardware
 - 4. Section 08800 - Glass & Glazing
 - 5. Section 08870 - Security Window Film

1.3 REFERENCES - FIBERGLASS REINFORCED POLYESTER/ALUMINUM HYBRID (FRP) FLUSH DOORS

- A. AAMA 1503-98 - Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- B. ANSI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Re-inforcings.
- C. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
- D. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.

- E. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- F. ASTM D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- G. ASTM D 543 - Evaluating the Resistance of Plastics to Chemical Reagents.
- H. ASTM D 570 - Water Absorption of Plastics.
- I. ASTM D 638 - Tensile Properties of Plastics.
- J. ASTM D 790 - Flexural Properties of Non-reinforced and Reinforced Plastics and Electrical Insulating Materials.
- K. ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
- L. ASTM D 1621 - Compressive Properties of Rigid Cellular Plastics.
- M. ASTM D 1623 - Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- N. ASTM D 2126 - Response of Rigid Cellular Plastics to Thermal and Humid Aging.
- O. ASTM D 2583 - Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
- P. ASTM D 5420 - Impact Resistance of Flat Rigid Plastic Specimens by Means of a Falling Weight.
- Q. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.
- R. ASTM E 84 - Surface Burning Characteristics of Building Materials.
- S. ASTM E 90 - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- T. ASTM E 283 - Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- U. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- V. ASTM E 331 - Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- W. ASTM F 476 - Security of Swinging Door Assemblies.
- X. ASTM F 1642-04 - Standard Test Method for Glazing Systems Subject to Air blast loading.
- Y. NWWDA T.M. 7-90 - Cycle Slam Test Method

Z. SFBC PA 201 - Impact Test Procedures.

AA.SFBC PA 203 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

BB. SFBC 3603.2 (b) (5) - Forced Entry Resistance Test.

1.4 PERFORMANCE REQUIREMENTS – FIBERGLASS REINFORCED POLYESTER/ALUMINUM HYBRID (FRP) FLUSH DOORS

A. General: Provide door assemblies that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.

B. Air Infiltration: For a single door 3'-0" x 7'-0", test specimen shall be tested in accordance with ASTM E 283 at pressure differential of 6.24 psf. Door shall not exceed **0.90** cfm per linear foot of perimeter crack.

C. Water Resistance: For a single door 3'-0" x 7'-0", test specimen shall be tested in accordance with ASTM E 331 at pressure differential of 7.50 psf. Door shall *not* have water leakage.

D. Indoor air quality testing per ASTM D 6670-01: GREENGUARD Environmental Institute Certified including GREENGUARD for Children and Schools Certification.

E. Hurricane Test Standards, Single Door with Single-Point Latching:

1. Uniform Static Load, ASTM E 330: Plus, or minus **75** pounds per square foot.
2. Forced Entry Test, 300 Pound Load Applied, SFBC 3603.2 (b) (5): Passed.
3. Cyclic Load Test, SFBC PA 203: Plus, or minus **53** pounds per square foot.
4. Large Missile Impact Test, SFBC PA 201: Passed.

F. Blast Test, Doors and Frames, ASTM F 1642-04, 6 psi / 41 psi-msec: Minimal Hazard.

G. Swinging Door Cycle Test, Doors and Frames, ANSI A250.4: Minimum of **25,000,000** cycles.

H. Cycle Slam Test Method, NWWDA T.M. 7-90: Minimum 5,000,000 Cycles.

I. Swinging Security Door Assembly, Doors and Frames, ASTM F 476: Grade **40**.

J. Salt Spray, Exterior Doors and Frames, ASTM B 117: Minimum of **500** hours.

K. Sound Transmission, Exterior Doors, STC, ASTM E 90: Minimum of **25**.

L. Thermal Transmission, Exterior Doors, U-Value, AAMA 1503-98: Maximum of **0.29** BTU/hr x sf x degrees F. Maximum of R-Value **3.4** Minimum of **55** CRF value.

M. Surface Burning Characteristics, FRP Doors and Panels, ASTM E 84:

1. Flame Spread: Maximum of **200**. (Class C).
2. Smoke Developed: Maximum of **450**. (Class C).

- N. Surface Burning Characteristics, Class A Option on Interior Faces of FRP Exterior Panels and Both Faces of FRP Interior Panels, ASTM E 84:
1. Flame Spread: Maximum of **25**.
 2. Smoke Developed: Maximum of **450**.
- O. Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 256: **15.0** foot-lbs per inch of notch.
- P. Tensile Strength, FRP Doors and Panels, Nominal Value, ASTM D 638: **14,000** psi.
- Q. Flexural Strength, FRP Doors and Panels, Nominal Value, ASTM D 790: **21,000** psi.
- R. Water Absorption, FRP Doors and Panels, Nominal Value, ASTM D 570: **0.20** percent after 24 hours.
- S. Indentation Hardness, FRP Doors and Panels, Nominal Value, ASTM D 2583: **55**.
- T. Gardner Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 5420: **120** in-lb.
- U. Abrasion Resistance, Face Sheet, Taber Abrasion Test, 25 Cycles at 1,000 Gram Weight with CS-17 Wheel: Maximum of **0.029** average weight loss percentage.
- V. Stain Resistance, ASTM D 1308: Face sheet unaffected after exposure to red cabbage, tea, and tomato acid. Stain removed easily with mild abrasive or FRP cleaner when exposed to crayon and crankcase oil.
- W. Chemical Resistance, ASTM D 543. Excellent rating.
1. Acetic acid, Concentrated.
 2. Ammonium Hydroxide, Concentrated.
 3. Citric Acid, 10%.
 4. Formaldehyde.
 5. Hydrochloric Acid, 10%
 6. Sodium hypochlorite, 4 to 6 percent solution.
- X. Compressive Strength, Foam Core, Nominal Value, ASTM D 1621: **79.9** psi.
- Y. Compressive Modulus, Foam Core, Nominal Value, ASTM D 1621: **370** psi.
- Z. Tensile Adhesion, Foam Core, Nominal Value, ASTM D 1623: **45.3** psi.
- AA. Thermal and Humid Aging, Foam Core, Nominal Value, 158 Degrees F and 100 % Humidity for 14 Days, ASTM D 2126: Minus **5.14** percent volume change.
- BB. Compliance with the International Building Code® IBC 2603 (2015, 2012 and 2009)

1.5 SUBMITTALS

- A. Comply with AIA A201 and Section 00800 for Submittal Procedures.

FVHD-5192 / 5193

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- B. Product Data: Submit door manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.
- C. Submit six sets of factory shop drawings for the fabrication and installation of the Fiberglass Reinforced Polyester (FRP) Doors, and Panels, and associated components of the work. Include wall elevations at 1/2" scale, and half-sized detail sections of every typical composite member. Show anchors, joint system, expansion provisions, and other components not included in the manufacturer's standard data. Include field-verified dimensions and glazing details.
- D. Samples:
 - 1. FRP Door: Submit corner samples of manufacturer's door showing face sheets, core, internal framing, finish, glazing, options, and accessories.
 - a. The architect reserves the right to require samples of typical fabricated sections, showing joints, exposing fastenings, (if any) quality of workmanship, hardware and accessory items, before fabrication of the work proceeds.
 - 2. Color: Submit manufacturer's color chip samples of Standard Pebble or Sandstone texture and Standard Anodized Door Perimeter.
- E. Test Reports: Submit certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.
- F. Manufacturer's Project References: Submit list of successfully completed projects including project name and location, name of architect, and type and quantity of doors manufactured.
- G. Maintenance Manual: Submit manufacturer's maintenance and cleaning instructions for doors.
- H. Warranty: Submit manufacturer's standard warranty.

1.11 QUALITY ASSURANCE

- A. Standards: Comply with the requirements and recommendations in applicable specifications and standards by NAAMM, AAMA and AA, including the terminology definitions and specifically including the "Entrance Manual" by NAAMM, except to the extent more stringent requirements are indicated.
- B. Code Compliance and Regulations: All materials supplied shall be in accordance with the International Building Code, State of New Jersey "Barrier-Free" Subcode, and all applicable State or Local Codes.
- C. Manufacturer shall have produced Fiberglass Reinforced Polyester/Aluminum Hybrid (FRP) Doors, Panels for a recommended 10 years and shall have completed projects like this building in type and size.
 - 1. **Obtain Doors and Components through one source from a single manufacturer.**

- D. Bidders are expected to visit the jobsite to make a complete survey of project requirements prior to bid. All dimensions, quantities and conditions relating to the installation shall be fully understood. Failure to visit the site will not relieve the successful bidder from the responsibility of furnishing all materials and services required to comply with the true intent and meaning of the specifications without any additional costs to the owner.
- E. Instructions: The manufacturer or representatives will be available for consultation to all parties engaged in the project, including instruction to installation personnel.
- F. An examination of product will include **cutting and/or disassembly of the entrance** to reveal the construction of the component. If the door, or component fails, replacement of the project's material will be required. This process will assure the owner of proper adherence to the bid documents.

1.12 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials supplied shall be delivered to the jobsite in their original, unopened packages, with labels intact. Materials shall be inspected for damage, and the manufacturer shall be advised immediately of any discrepancies. Unsatisfactory materials are not to be used.
- B. All materials supplied shall be packaged in individual corrugated cartons. Doors and panels shall be "floated" within cartons, with no portion of the door having contact with the outer shell of the container.
- C. Handling: Protect materials and finish from damage during handling and installation.

1.13 SPECIAL PROJECT WARRANTY

- A. Provide a written warranty, signed by Manufacturer, Installer and Contractor, agreeing to replace, at no cost to the Owner, any doors, frames or panels that fail in materials or workmanship, within the time of acceptance, as indicated below.
 - 1. Failure of materials or workmanship includes excessive deflection, faulty operation of entrances, deterioration of finish, or construction, more than normal weathering and defects in components of the work.
- B. Warranty Period: Ten (**10**) years from approved date of substantial completion as determined by architect.
- C. Limited Lifetime Warranty covering the following:
 - 1. Failure of corner joinery.
 - 2. Core deterioration.
 - 3. Delamination or bubbling of door skin.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Products listed herein are as manufactured by Special-Lite, Inc., Decatur, Michigan. Tel.# 800.821.6531 / 269.423.7068, www.special-lite.com. NJ Sales Rep: Joseph Boltzer, 862-266-7344.
- B. Comparable products by other manufacturers may be submitted for consideration as equal, subject to the requirements of Division 1. Subject to exact compliance with requirements:
 - 1. Vista Wall, Inc. – Lincoln, Rhode Island
 - 2. Tubelite, Inc. – Reed City, Michigan
 - 3. Or approved equal.

2.2 FIBERGLASS REINFORCED POLYESTER (FRP) FLUSH DOORS

- A. Model: SL-17 Flush Doors with SpecLite3 fiberglass reinforced polyester (FRP) face sheets.
- B. Door Opening Size: As indicated on the Drawings.
- C. Door Construction:
 - 1. Doors are to be 1-3/4" thick Special-Lite series SL-17. (FRP).
 - 2. Stiles and Rails: Constructed of aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T5 alloy recovered from industrial processes, minimum/maximum 2-5/16-inch depth, joined with steel tie rods.
 - a. Stile and Rails width greater than 2-5/16" is not acceptable.
 - 3. Stiles to be tubular shape to accept hardware as specified.
 - 4. Top and bottom rails to be extruded with legs for interlocking "rigidity weather bar."
 - 5. Corners: Mitered.
 - a. Butted Mortise and Tenon joints with rigid fillet welds is not acceptable.
 - 6. Joinery to be 3/8" tie rods, top and bottom, bolted through an extruded spline, in both top and bottom rails with 3/16" mechanically fastened (screwed) reinforcing angles, and secured with hex type nuts. Welds, glue, or other methods are not acceptable.
 - 7. All doors shall be pre-machined in accordance with templates from the hardware manufacturer. For surface applied hardware, doors shall have necessary reinforcement, including the attachment of RIVNUT blind bolt fasteners. Except for door closers and holders, which require field applications, doors are to be shipped with hardware attached.

8. Vision Lites: Provide glazed openings in doors as indicated, with manufacturer's standard aluminum moldings and stops, with removable stops on inside only. Glass to be "factory installed" for warranty purposes.
9. Face sheets to be locked in with extruded interlocking edges, which are the integral reglets of the Vertical and Horizontal rails permitting a flush appearance. No snap-on or screwed-on trim or caps will be accepted.
10. Core is to be of foamed in place Urethane foam minimum of 5 lbs. per cubic foot density. Minimum R Value of 9.
 - a. All doors are to be properly reinforced for hardware prior to Urethane core foaming in door.
11. Face sheets for Fiberglass Reinforced Polyester (FRP) Doors are to be Kemlite SpecLite3®, 120" thick (pebble like texture) with color throughout. Color: Selected from Manufacturer's twelve (12) Standard colors.]
12. Glue: Use of glue to bond sheet to core or extrusions is not acceptable.
13. Edge Capping: Screw applied edge capping is not acceptable.

2.3 MATERIALS AND ACCESSORIES – FIBERGLASS REINFORCED POLYESTER/ALUMINUM HYBRID (FRP) FLUSH DOORS

- A. Aluminum Members: Provide alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish and control of color; ASTM B 221 for extrusions, ASTM B 209 for sheet/plate, with a minimum wall thickness of 0.125"
- B. Fasteners: Provide aluminum, non-magnetic stainless steel or other non-corrosive metal fasteners, guaranteed by the manufacturer to be compatible with the doors, frames, stops, panels, hardware, anchors, and other items being fastened. For exposed fastener (if any), provide Vandal-proof flat head screws with finish matching the item to be fastened.
 1. Do not use exposed fasteners, except where unavoidable for the assembly of units, or unavoidable for the fastening of hardware. Provide only concealed screws in glazing stops.
- C. Reinforcement and Brackets: Manufacturer's standard formed or fabricated steel units, of shapes, plates, or bars, with 2.0 ounce hot-dip zinc coating, complying with ASTM A 123, applied after fabrication.
- D. Expansion Anchor Devices: Lead shield or toothed steel, drill-in, expansion bolt anchors.
- E. Bituminous Coating: Cold applied asphalt mastic complying with SPC-PS 12, compounded for 30-mil thickness per coat.

- F. Sealants and Gaskets: Provide sealants and gaskets in the fabrication, assembly and installation of the work, which are recommended by the manufacturer to remain permanently elastic, non-shrinking, non-migrating and weatherproof.
- G. Glazing Gaskets: For glazing factory-installed glass, and for gaskets, which are factory-installed in "captive" assembly of glazing stops, provide manufacturer's standard stripping of molded neoprene, complying with ASTM D 2000 (Designation 2BC415 to 3 BC620), or molded PVC complying with ASTM C 509, Grade 4.

2.4 FABRICATION

- A. Sizes and Profiles: The required sizes for door units, and profiles requirements are to be "field verified".
- B. Coordination of Fabrication: Check the actual frame or door openings in the construction work by accurate field measurements before fabrication and show recorded measurements on final shop drawings.
- C. Assembly:
 - 1. Complete the cutting, fitting, forming, drilling and grinding of all metal work prior to the cleaning, finishing, treatment and application for coatings.
 - 2. Remove burrs from cut edges, and ease edges and corners to a radius of approximately 1/64".
- D. **Welding: No Welding of any Door or Frame joints will be accepted.**
- E. Fasteners: Conceal fasteners, wherever possible, except as otherwise noted.
- F. Fit:
 - 1. Maintain continuity of line and accurate relation of planes and angles.
 - 2. Provide secure attachments and support at mechanical joints, with hairline fit at contacting members.
- G. Reinforce the work as necessary for performance requirements and as required for support to the structure. Separate dissimilar metals and bituminous paint or performed separators, which will prevent corrosion. Separate metal surfaces at moving joints with non-metallic separators to prevent "freeze-up" of joints.
- H. Sealant- for Heavy Wall Tube-Aluminum Frame, use silicone sealant as specified in Section 07900.

2.5 GLAZING AND VISION LITES

- A. Provide glazing system for doors to receive lites. Design system for replacement of glass, but for non-removal of glass from the exterior.
 - 1. All glass in doors is to be factory installed.

2. Glass for exterior doors to be: As detailed on drawings. Refer to **Section 08800**.
- B. Factory Glazing: 1-inch glass insulating units.
- C. Lites in Exterior Doors: Allow for thermal expansion
- D. Rectangular Vision Lites: FL-Series system
 1. FL-Series shall be factory glazed with 1" insulated glass.

2.6 ALUMINUM FINISH

Preparation: Prior to fabrication of doors, prepare the aluminum surfaces or finishing in accordance with the Aluminum Producer's recommendations, and the standards of the Finisher or Processor. Process all components of each assembly simultaneously to attain complete uniformity of color.

- A. Anodized Finish: Clear 215 R1, AA-M10C12C22A41, Class I, 0.7 mils thick. – (Standard)

2.7 FINISH HARDWARE

- A. Refer to Hardware Sets in **Section 08700** for the Finish Hardware required for this project.
 1. List the approved Finish Hardware items to be supplied and installed by the door / frame manufacturer on submissions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.3 INSTALLATION – Fiberglass Reinforced Polyester/Aluminum Hybrid (FRP) Doors

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Set thresholds in bed of mastic and backseal.
- F. Install exterior doors to be weathertight in closed position.
- G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

- H. Remove and replace damaged components that cannot be successfully repaired as **determined by Architect.**

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

3.5 ADJUSTING

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.6 CLEANING

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish or glazing.

3.7 PROTECTION

- A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION 08410

SECTION 08415 - ALUMINUM – FRAMED ENTRANCES AND STOREFRONT SYSTEM

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 pre-engineered, thermally broken center glazed aluminum screw spline storefront and related accessories.

1.3 RELATED SECTIONS

- A. Section 01030 – Alternate Bids
- B. Section 07900 – Joint Sealer Assemblies
- C. Section 08410 - FRP Doors
- D. Section 08700 - Finish Hardware
- E. Section 08800 – Glass and Glazing
- F. Section 08872 – Security Window Film

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design:
 - 1. 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. Designated Design includes, but is not limited to:
 - a. Aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by a qualified professional engineer responsible for their preparation in the State of New Jersey.
 - 2. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing entrance and storefront systems similar to those required for this Project and who is acceptable to manufacturer.
 - a. Engineering Responsibility: Prepare data for entrance and storefront systems, including Shop Drawings, based on testing and engineering analysis of

manufacturer's standard units in assemblies similar to those indicated for this Project.

- B. Testing Agency Qualifications: Demonstrate to Architect's satisfaction, based on Architect's evaluation of criteria conforming to ASTM E 699, that the independent testing agency has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- C. Source Limitations: Obtain each type of entrance and storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of entrance and storefront systems and are based on the specific systems indicated. Other manufacturers' systems with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
 - 1. Do not modify intended aesthetic effect, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Preconstruction Sealant Testing: Perform sealant manufacturers' standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants and each condition required by system.
 - 1. Test a minimum of 8 samples of each metal, glazing, and other material.
 - 2. Prepare samples using techniques and primers required for installed systems.
 - 3. Perform tests under environmental conditions that duplicate those under which systems will be installed.
 - 4. For materials that fail tests, determine corrective measures required to prepare each material to ensure compatibility with and adhesion of sealants, including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.
- F. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code–Aluminum."
- G. Mockups: Before installing entrance and storefront systems, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for completed Work.
 - 1. Locate mockups in the location and of the size indicated or, if not indicated, as directed by Architect.

2. Notify Architect 7 calendar days in advance of the dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before proceeding with installation of systems.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. When directed, demolish and remove mockups from Project site.
 - b. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements". Do not modify size and dimensional requirements.
 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. 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 for type(s) of storefront elevation(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of aluminum-framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.7 SUBMITTALS

- A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
 - 1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.
- B. 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 the thermal performance ratings of the manufacturer's framing combined with the specified 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.

1.8 WARRANTIES

- A. Total Storefront Installation
 - 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings.
 - 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
- B. Window Material and Workmanship
 - 1. Provide written guarantee against defects in material and workmanship for **three (3) years** from the date of final shipment.
- C. Glass
 - 1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
 - 2. Warranty period shall be for **ten (10) years**.
- D. Finish
 - 1. Warranty period shall be for **twenty (20) years** from the date of final shipment.
 - 2. Provide organic finish warranty based on AAMA standard 2605.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: "System 403 Thermal Flush-Glazed, Screw Spline Storefront System" as manufactured by EFCO Corp.; or approved equal.
- B. Subject to compliance with requirements, manufacturers of products which may be incorporated in the work include, but are not limited to, the following:
 - 1. Kawneer Company, Inc.,
 - 2. Architectural Window Manufacturing Corporation,
 - 3. Oldcastle Building Envelope,
 - 4. Tubelite,
 - 5. Or approved equal.

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window 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. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
- G. Thermal Barrier
 - 1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite

action between the exterior and interior extrusions.

2. Barrier material shall be poured-in-place, two-part polyurethane. A nonstructural thermal barrier is unacceptable.

2.2 FABRICATION

A. General

1. All aluminum frame extrusions shall have a minimum wall thickness of .080" (2 mm).
2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.

B. Frame

1. Depth of frame shall not be less than 4-1/2" (114 mm).
2. Face dimension shall not be less than 2" (50 mm).
3. Frame components shall be screw spline construction.

C. Glazing:

1. All units shall be "dry glazed" with gaskets on both exterior and interior of the glass.

D. Finish:

| <u>AA Description</u> | <u>Description</u> | <u>AAMA Guide Spec.</u> |
|-----------------------|--------------------|-------------------------|
| AA-M12-C42-R1X | 70% PVDF Ultrapon™ | 2605-98 |

PART 3 - EXECUTION

3.1 INSPECTION

A. Job Conditions

1. All openings shall be prepared by others to the proper size and shall be plumb, level and in the proper location and alignment as shown on the architect's drawings.

3.2 INSTALLATION

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Storefront system shall be erected plumb and true, in proper alignment and relation to established lines and grades.
- C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather stripping contact and hardware movement shall be checked and final adjustments made for proper operation and performance of units.

- D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.
- E. Sealing materials specified shall be used in strict accordance with the manufacturer's printed instructions, and shall be applied only by mechanics specially trained or experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

3.3 ANCHORAGE

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.4 PROTECTION AND CLEANING

- A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

END OF SECTION 08415

SECTION 08700 – 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.
 - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware, power supplies, back-ups and surge protection.
 - 3. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section “Fiberglass Doors”,
- 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.
 - 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. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.

2. Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- E. 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. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a recommended 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: Installers, trained by the primary product manufacturers, with a recommended minimum 3 years documented experience installing both standard and electrified builders 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 recommended minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing 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 both standard and electromechanical door hardware and keying.
 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third-party source will not be accepted.

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2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 3. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
 4. Fire-Rated Door Assemblies: Provide door hardware for 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 NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
 - a. Test Pressure: Positive pressure labeling.
- F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.
 3. Requirements for key control storage and software.
 4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.
- H. 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 (including electromechanical 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. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. 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. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- 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, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

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 and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

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 and electrified 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.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: **One (1) year** from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. **Five (5) years** for exit hardware.
 - 2. **Twenty-five (25) years** for manual surface door closers.
 - 3. **Two (2) years** for electromechanical door hardware.

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.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
 - 1. 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:
 - a. 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.
- B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical 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. Continuous Geared Hinges: ANSI/BHMA A156.26 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. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy-duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90 minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size and provide with removable service power transfer panel where indicated at electrified openings.
 - 1. Acceptable Manufacturers:
 - a. McKinney Products (MK).
 - b. Pemko Manufacturing (PE).
 - c. Or approved equal.

2.3 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

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1. Acceptable Manufacturers:
 - a. McKinney Products (MK) - QC (# wires) Option.
 - b. Or approved equal.

B. Electric Door Hardware Cords: Provide electric transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Acceptable Manufacturers:
 - a. McKinney Products (MK) - QC-C Series.
 - b. Or approved equal.

Provide one each of the following tools as part of the base bid contract:

- a. McKinney Products (MK) - Electrical Connecting Kit: QC-R001.
- b. McKinney Products (MK) - Connector Hand Tool: QC-R003.
- c. Or approved equal.

2.4 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. 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.
3. 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.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

- a. Acceptable Manufacturers:
 - 1) Burns Manufacturing (BU).
 - 2) Rockwood Manufacturing (RO).
 - 3) Trimco (TC).
 - 4) Or approved equal.

2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum ten (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 straight- or clover-type cam.
 - 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. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
 - 1. Existing System: Master key or grand master key locks to Owner's existing system.
- E. Key Quantity: Provide the following minimum number of keys:
 - 1. Per Owner's requirements.
- F. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".
- G. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

2.6 ELECTROMECHANICAL LOCKING DEVICES

- A. Electromechanical Cylindrical Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical cylindrical locksets, electrified locksets to be of type and design as specified below.
 - 1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - CL33900 Series.
 - b. Sargent Manufacturing (SA) - 10G70/71 Series.
 - c. Or approved equal.

2.7 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.
- 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 A156.5.
 4. Dustproof Strikes: BHMA A156.16.

2.8 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.
 - a. Fire Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions to be used only with exit devices for which they have been tested.

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 not acceptable except in any case where the door light extends behind the device as in a full glass configuration.
 5. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
 6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy-duty trim with cold forged escutcheons, beveled edges, and four 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. Provided free-wheeling type trim where indicated.
 - b. Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.
 7. Vertical Rod Exit Devices: Provide and install interior surface and concealed vertical rod exit devices as Less Bottom Rod (LBR) unless otherwise indicated.
 8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 11. 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. Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness. Painted or aluminum metal rails are not acceptable. Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Or approved equal.

2.9 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 and UBC 7-2 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.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.
- B. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA 156.4, Grade 1 certified 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. Unitrol arms to have door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - Unitrol DC8000 Series.

- b. Norton Door Controls (NO) - Unitrol 7500 Series.
- c. Or approved equal.

2.10 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 UBC 7-2, 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, based on testing according to ASTM E 1408.
- 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. Acceptable Manufacturers:
 - 1. Pemko Manufacturing (PE).
 - 2. Reese Enterprises, Inc. (RS).
 - 3. Zero International (ZE).
 - 4. Or approved equal.

2.11 ELECTRONIC ACCESSORIES

- A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
 - 1. Acceptable Manufacturers:
 - a. Securitron (SU) - DPS Series.
 - b. Or approved equal.

- B. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

- 1. Acceptable Manufacturers:

- a. Corbin Russwin Hardware (RU) – 782.
- b. Securitron (SU) - BPS Series.
- c. Or approved equal.

2.12 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.

2.13 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.

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- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical 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, and 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 and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

- 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. Manufacturer's Abbreviations:

- 1. PE - Pemko
- 2. RU - Corbin Russwin
- 4. HS - HES
- 4. RO - Rockwood
- 5. NO - Norton
- 6. SU - Securitron

Hardware Schedule

Set: 1.0

Doors: FRP AR1

| | | | |
|---------------------------------|---------------------------------|-------|----|
| 2 Continuous Hinge | CFM-HD1 Series | | PE |
| 1 Removable Mullion | 910KM x LAR CT6SD | | RU |
| 1 Exit Device (rim, nightlatch) | ED5200 K157 M110 M52 CT6SD | 630 | RU |
| 1 Exit Device (rim, exit only) | ED5200 M110 M52 CT6SD | 630 | RU |
| 4 Cylinder Core | Facility Standard | 626 | |
| 1 Electric Strike | 9600 | 630 | HS |
| 1 SMART Pac Bridge Rectifier | 2005M3 | | HS |
| 1 ElectroLynx Harness | QC-CX sized for Electric Strike | | MK |
| 2 Door Pull | BF158 Mtg-Type 12HD | US32D | RO |
| 2 Door Closer | UNI7500 | 689 | NO |
| 1 Mullion Gasket | By FRP MFG | | |
| 1 Perimeter Gasket | By FRP MFG | | |
| 1 Astragal | By FRP MFG | | |

Notes: Wiring for Electric Strike should have quick disconnects and extra length of wire in mullion Remote Release from main office

Set: 2.0

Doors: NOT USED

Notes: Balance of hardware to remain

All existing openings need to be verified in the field

Field adjust, repair, and refinish existing frame to like new condition.

where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation

Set: 3.0

Doors: AR2

| | | | |
|---------------------------------|----------------------------|-------|----|
| 2 Continuous Hinge | CFM-HD1 Series | | PE |
| 1 Removable Mullion | 910KM x LAR CT6SD | | RU |
| 1 Exit Device (rim, nightlatch) | ED5200 K157 M110 M52 CT6SD | 630 | RU |
| 1 Exit Device (rim, exit only) | ED5200 M110 M52 CT6SD | 630 | RU |
| 4 Cylinder Core | Facility Standard | 626 | |
| 2 Door Pull | BF158 Mtg-Type 12HD | US32D | RO |
| 2 Door Closer | UNI7500 | 689 | NO |
| 1 Mullion Gasket | By FRP MFG | | |
| 1 Perimeter Gasket | By FRP MFG | | |
| 1 Astragal | By FRP MFG | | |

All existing openings need to be verified in the field.

Field adjust, repair, and refinish existing frame to like new condition.

Where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide

FVHD-5192/ 5193

2:08700-17

proper door operation

Set: 4.0

Doors: Office AR5

| | | |
|-----------------|------------------------|----------|
| 3 Hinges | TA2714 4-1/2" x 4-1/2" | US26D MK |
| 1 Office Lock | CL3351 NZD | US26D MK |
| 1 Cylinder Core | Facility Standard | 626 |
| 1 Door Closer | 7500 / P7500 | 689 NO |
| 1 Kickplate | K1050 10" high 4BE | US32D RO |
| 1 Gasketing | S88BL | PE |

END OF SECTION 08700

SECTION 08800 - GLASS AND GLAZING

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.
- B. Related Sections:
 - 1. Section 01030 - Alternate Bids
 - 2. Section 08110 - Hollow Metalwork
 - 3. Section 08211 - Wood Doors
 - 4. Section 08410 - FRP Doors & Aluminum Frames
 - 5. Section 08870 - Security Window Film
 - 6. Section 08871 - Security Glazing (Alternate Bid)

1.2 SUMMARY

- A. Extent of glass and glazing work is indicated on drawings and schedules.
- B. Extent of application of window film is indicated on drawings and schedules.
- C. Type of work or locations requiring glass and glazing includes, but is not limited to, glass types scheduled herein and on the drawings.
 - 1. Wood Doors.
 - 2. FRP Door and Aluminum Frames.
 - 3. Transom window with speaker hole and half-round pass-thru in hollow metal frame.

1.3 QUALITY ASSURANCE

- A. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.
- B. Fire-Rated Door Assemblies: 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 NFPA 252.
- C. Safety Glass: Categories I and II materials complying with testing requirements in CPSC 16CFR1201 and permanently marked with label of:
 - 1. Safety Glazing Certification Council (SGCC).
- D. Insulating Glass Seal Standard: Comply with ASTM E 774, Class C.
 - 1. Comply with International Building Code for insulated tempered glass.
 - 2. Label each unit permanently on spacer or on one pane.

3. Certification agency:
 - a. Insulating Glass Certification Council (IGCC).
 - b. Associated Laboratories, Inc. (ALI).

- E. Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator with a recommended 5 years of successful experience in the production of each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

- F. Installer (Glazier): A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program
 1. Firm with a recommended 5 years of successful experience in glazing work similar to required work.

- G. All glass shall bear the Label of the manufacturer.

- H. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with an appropriate certification label of IGCC.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including documentation of compliance with requirements and instructions for handling, storing, installing, cleaning and protecting each type of glass and glazing material, and installation and maintenance instructions.

- B. Before any glass is delivered to the job site, submit sections and details of glass installation at framing members.

- C. Samples: Submit for verification purposes, 12" square samples of each type of glass indicated except for clear single pane units, and 12" long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative of adjoining framing system in color.
 1. Submit insulating glass samples with completed edge-seal construction, but hermetic seal need not be maintained.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

- B. Protect window film, glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.6 PROJECT CONDITIONS

- A. Examine framing and substrate work to receive glass and glazing materials, and condition under which glass is to be installed. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- B. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.
 - 1. Install liquid sealants at ambient and substrate temperatures above 40°F.

1.7 WARRANTY

- A. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: **Ten (10) years** from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: **Ten (10) years** from date of Substantial Completion.
- C. Manufacturer's Limited Warranty on Fire-Rated / Impact Gazing: Written warranty, made out to the Owner and signed by manufacturer, warrants only that the product will be free of manufacturing defects resulting in material obstruction through the glass area and/or edge separation and changes in properties of the interlayer for a period of **five (5) years** from the date of purchase, provided the Products have been properly shipped, stored, handled, installed and maintained.
 - 1. Limitation of Remedy - Inspection: The remedy for product proved to be defective under the terms of this warranty is limited to shipment of replacement product. With respect to all claims under this warranty, the Manufacturer shall have the right to inspect any and all products alleged to be defective.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include; but are not limited to, the following:
 - 1. Standard Glass, Insulating Glass and Spandrel Glazing Products:
 - a. Pilkington, Libbey-Owens-Ford, (LOF)
 - b. Vitro Architectural Glass (formally PPG Glass)
 - c. Guardian Industries Corp.
 - d. Or approved equal

2. Fire Rated Glass Assemblies:
 - a. SuperLite II-XL by Safli First, a Division of O'Keeffe's Inc.
 - b. Pyran® Platinum by Schott Glass Products
 - c. Or approved equal.

2.2 PRIMARY GLASS PRODUCTS

- A. Clear Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class 1 (clear), Quality-Q3 (glazing select).
- B. Uncoated Tinted Float Glass: Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality-Q3 (glazing select), and as follows:
 1. Manufacturer's standard **gray** tint, with visible light transmittance of 33% and shading coefficient of 0.31 for 1/4" thick glass.
 2. Manufacturer's standard **clear**, with visible light transmittance of 70% and shading coefficient of 0.44 for 1/4" thick glass.
- C. Energy Advantage Low-E Glass: Manufacturer's standard clear color Low-E glass, coated on third surface with light transmittance:
 1. Gray Tint: 33% and shading coefficient of .28 for 1/4" thick glass.
 2. Clear: 33% and shading coefficient of .44 for 1/4" thick glass.
- D. Ceramic-Coated Heat-Treated Spandrel Glass: ASTM C 1048, Condition B (spandrel glass, one surface ceramic coated), Type I (transparent glass, flat), Class 1 (clear), Quality-Q3 (glazing select), with ceramic coating applied to second surface and complying with the following requirements:
 1. Color: As selected by Architect from manufacturer's standard colors.

2.3 INSULATING GLAZING

- A. Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
- B. Provide insulating glass for applications in exterior doors, side lites, storefront units, curtain wall systems, aluminum windows and as follows:
 1. Exterior pane shall 1/4-inch thick tinted glass to meet indicated requirements.
 2. Interior pane shall be 1/4-inch thick "Low-E" coating on the third surface.
 3. Units shall be tempered where within 6 feet of a door or where "tempered" or "safety" glass is required by Code.

4. Double Glass Performance Data:
 - a. Clear:
 - 1) Visible light transmittance of 70%,
 - 2) Solar Energy Transmittance of 33%,
 - 3) U-Factor: Summer (Air) of 0.27,
 - 4) U-Factor: Winter (Air) of 0.29,
 - 5) Solar Heat Gain Coefficient of 0.38,
 - 6) Shading coefficient of 0.44.
 - b. Gray Tint (2nd surface):
 - 1) Visible light transmittance of 33%,
 - 2) Solar Energy Transmittance of 18%,
 - 3) U-Factor: Summer (Air) of 0.28,
 - 4) U-Factor: Winter (Air) of 0.29,
 - 5) Solar Heat Gain Coefficient of 0.25,
 - 6) Shading coefficient of 0.28.

2.4 FIRE-RATED / IMPACT GLAZING

- A. Fire protection rated and impact safety rated glazing material with a thickness of approximately 3/8" (9mm), made from laminated glass ceramic with a transparent appearance.
 1. Units are tested listed and labeled by Underwriters Laboratories Inc., UL., for the following applications and comply with the following Agencies:
 - a. Classified and labeled by Underwriters Laboratories, Inc.®. Test report number for labeled fire-rated assemblies is UL File No. R22036.
 - b. All above tests performed in accordance with UL 9, UL 10B, UL 10C, NFPA 257, NFPA 80, ASTM E2010-01, ASTM E2074-00.
 - c. This product is not considered a barrier to radiant heat and has not met the ASTM E-119 or UL 263 test standards.
 - d. Fire rated for up to 90 minutes with required hose-stream test.
 - e. Withstands thermal shock.
 3. Impact rating: ANSI Z97.1 (Class A) and CPSC 16CFR1201 (Cat. I and II).
 4. Passes positive pressure test standard UL 10C.
 5. Laminated floated glass-ceramic.
 6. Clear and colorless without the distracting amber tint associated with competitive glass-ceramics. Microfloat process allows for smooth surface and distortion-free mirror finish.
 7. Approved for use with any fire-rated frame.

8. Sound Transmission Class (STC): 36
9. The panel must be placed on calcium silicate or hardwood setting blocks and glazed using PYRAN® Platinum classified glazing tape, such as closed cell PVC, Fiberfrax tape or Pemko FG3000S90.

B. Subject to compliance with requirements, provide the following:

1. FRIG -1: Fire-Rated / Impact Glazing; Provide “**Pyran® Platinum L**”, as manufactured by Schott Glass Products; or approved equal.
 - a. Door lites, transoms or sidelites, and windows with fire rating requirements up to 90 minutes.

2.5 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for category II materials, for kinds of laminated glass indicated and other requirements specified as following:

1. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
 - a. Interlayer Material: Polyvinyl butyral sheets.
2. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:
 - a. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.
3. Inner Lite: Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select).
 - a. Class 2 (tinted).
 - b. Thickness: 1/4"
4. Outer Lite: Tempered glass type.
 - a. Thickness: 1/4".
5. Plastic Interlayer: 0.060 inch thick.

2.6 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES

- A. General: Provide color of exposed glazing sealant compound as selected by Architect from manufacturer's standard colors, or black if no color is so selected. Comply with manufacturer's recommendations for selection of hardness, depending upon the location of each application, conditions at time of installation, and performance requirements as indicated. Select materials, and variations or modifications, carefully for compatibility with surfaces contacted in the installation.
- B. 1 Part Silicone Rubber Glazing Sealant: Elastomeric silicone sealant complying with FS TT-D-001543, Class A, non-sag. Provide acid type recommended by manufacturer where only non-porous bond surfaces are contacted; provide non-acid type recommended by manufacturer where one or more porous bond surfaces are contacted.

- C. Butyl Rubber Glazing Tape: Partly-vulcanized, self-adhesive, non-staining, elastomeric butyl rubber tape. 98% solids, intended for 35% compression, no appreciable deterioration for 3000 hour test in Atlas Weatherometer; either plain or pre-shimmed as required for proper installation of glass.

2.7 GLAZING COMPOUND FOR FIRE-RATED GLAZING MATERIALS

- A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.
 - 1. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
 - a. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.
- C. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
- D. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.
- E. Compressible Filler Rods: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.2 STANDARDS AND PERFORMANCE

- A. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.
- B. Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.
- C. Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Inspect each piece of glass immediately before installation, and discard pieces which have significant edge damage or face imperfections.
- F. Unify appearance of each series of lites by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other piece.
- G. Install insulating glass units to comply with recommendations by Sealed Insulating Glass Manufacturers Association, except as otherwise specifically indicated or recommended by glass and sealant manufacturers.

3.3 PREPARATION FOR GLAZING

- A. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.
- B. Apply primer or sealer to joint surfaces where recommended by sealant manufacturer.

3.4 GLAZING

- A. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.
- B. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

- C. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
- D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- E. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.
- F. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
- G. Tool exposed surfaces of sealants to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
- H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.
- I. Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.5 PROTECTION AND CLEANING

- A. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Protect glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.
- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- D. Maintain glass in a reasonably clean condition during construction, so that it will not be damaged by corrosive action and will not contribute (by wash-off) to deterioration of glazing materials and other work. Comply with manufacturer's instructions.
- E. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass manufacturer's recommendations for final cleaning.

END OF SECTION 08800

SECTION 08870 - SECURITY WINDOW FILM

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 SECTION INCLUDES

- A. Field applied security film and rigid pvc cap system applied to glazed surfaces and glazing framing systems.

1.3 RELATED SECTIONS

- A. Section 08110 - Hollow Metal
- B. Section 08410 - FRP Doors and Aluminum Framing Systems
- C. Section 08800 - Glass and Glazing

1.4 REFERENCES

- A. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.
- B. ASTM International (ASTM):
 - 1. ASTM D 882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 - 2. ASTM D 1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
 - 3. ASTM D 1044 - Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
 - 4. ASTM D 2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting.
 - 5. ASTM D 4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing.
 - 6. ASTM E 84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
 - 7. ASTM E 308 - Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.
 - 8. ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.

9. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 10. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
- C. Window 5.2 - A Computer Tool for Analyzing Window Thermal Performance; Lawrence Berkeley Laboratory.
 - D. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
 - E. Consumer Products Safety Commission 16 CFR, Part 1201 - Safety Standard for Architectural Glazing Materials.
 - F. GSA Standard Test for Glazing and Glazing Systems Subject to Airblast Loadings.
 - G. ISO 16933, International Standard for Glass in Building: Explosion-resistant security glazing - Test and classification for arena air-blast testing.
 - H. Underwriters Laboratories Inc. (UL): UL 972 - Burglary Resisting Glazing Material.

1.5 PERFORMANCE REQUIREMENTS

- A. Fire Performance: Surface burning characteristics when tested in accordance ASTM E 84:
 1. Flame Spread: 25, maximum.
 2. Smoke Developed: 450, maximum.
- B. Abrasion Resistance: Film must have a surface coating that is resistant to abrasion such that, less than 5 percent increase of transmitted light haze will result in accordance with ASTM D 1044 using 50 cycles, 500 grams weight, and the CS10F Calbrase Wheel.

1.6 SUBMITTALS

- A. Submit under provisions of AIA A201 and Section 00800.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Selection Samples: For each film specified, submit film samples representing manufacturer's film type for the project.
- D. Verification Samples: For each film specified, two samples representing film color and pattern.

- E. Performance Submittals: Provide laboratory data of emissivity and calculated window U-Factors for various outdoor temperatures based upon established calculation procedure defined by the ASHRAE Handbook of Fundamentals, Chapter 29, or Lawrence Berkeley Laboratory Window 5.2 Computer Program.
- F. **Letter from the manufacturer of the security film that the contractor is a certified installer.**
- G. **Shop drawings from the installer / manufacturer of the security window film illustrating all conditions of the Impact Protection Adhesive (IPA) overlap distance onto the adjacent glazing framing system.**

Note: Installation of the security window film shall not proceed until the submittals of all conditions are submitted.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.
 - 1. **Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.**
 - 2. Provide a commercial building reference list of 5 properties where the installer has applied window film. This list will include the following information:
 - a. Name of building.
 - b. The name and telephone number of a management contact.
 - c. Type of glass.
 - d. Type of film.
 - e. Amount of film installed.
 - f. Date of completion.
 - 3. Provide a Glass Stress Analysis of the existing glass and proposed glass/film combination as recommended by the film manufacturer.
 - 4. Provide an application analysis to determine available energy cost reduction and savings.
- C. **Window Security Film Pre-Installation Meeting:** Prior to installation of the Security Window Film, there shall be a Pre-Installation Meeting with the General Contractor, Window Security Film Subcontractor, and the Architect. At this meeting, products and installation requirements and shall be reviewed.
- D. Mock-Up: Provide a mock-up for evaluation and approval by the Architect of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.

2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.10 WARRANTY

- A. At project closeout, provide to Owner or Owners Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
- B. Basis of Design Manufacturer and the Authorized Window Film Dealer (collectively referred to as "Seller") warrant for **twelve (12) years** from installation, and provided that the product is maintained in accordance with the Window Care Instructions below, that the Safety & Security Window Film will:
 1. Maintain Adhesion Properties without blistering, bubbling, or delaminating from the glass,
 2. Maintain Appearance without discoloration,
 3. Maintain Strength, Tear, and Penetration Resistant Properties as defined in product literature.

Warranty Applicable with additional purchase & installation of Impact Protection System Adhesive or Profile:

4. With the purchase of Impact Protection Profile or Impact Protection Adhesive on all four (4) sides of the window, for the entire project, Manufacturer and the Authorized Window Film Dealer agree to extend the terms of this warranty an **additional two (2) years**, for a total of a **fourteen (14) year** warranty. This includes the film, attachment system, and labor. No changes are made to the glass breakage warranty.
5. The Impact Protection System Adhesive or Profile warranty applies to new Safety & Security Window Film installations. The adhesive or profile Product will meet Product specifications in effect at time of installation. The warranty period is **twelve (12) years** from the date of installation for a two sided application, and **fourteen (14) years** for a 4 sided application. This shall not cover failure due to disintegration of the underlying

substrate, movement of the structure exceeding specification for elongation and/or compression, changes in appearance of the adhesive due to dirt or other contaminants, tampering or other modifications applied after installation.

- a. Film warranty is void if the attachment system is removed for reasons other than to replace product found defective under this warranty. Application of Non-System Manufacturer wet glaze attachment system voids the Safety & Security Film Warranty. If the product does not conform to this warranty, the sole and exclusive remedy is:
 - 1) Replacement of the quantity of film proved to be defective; and,
 - 2) Provide removal and reapplication labor of like quality product free of charge.
6. Seller also warrants against glass failure due to thermal shock fracture, (maximum value of \$500 per window) caused only as a direct result of the application of Safety & Security Window Film provided the film is applied to recommended types of glass and the glass failure is reported to the Seller within the specified time (listed below) from the start of the installation. Glass breakage coverage is only valid for Safety & Security Window Films.
 - a. **Sixty (60) months** coverage against thermal shock fracture,
 - b. Any glass failure covered by this warranty must be reviewed by Seller prior to repair, and only covers film and glass replacement.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: "Ultra S140 Safety and Security Window Film" by 3M Window Film, Tel: #800.480.1704/651.733.2222; Web: www.3m.com/windowfilm; or approved equal.
 1. Subject to compliance with requirements of the Contract Documents, manufacturers offering products which may be incorporated in work include the following:
 - a. Equivalent by Saint-Gobain Solar Gard, Tel. # 877.273.4364/858-576-0200; www.solargard.com.
 - b. Or approved equal.
 2. Requests for substitutions will be considered in accordance with provisions of AIA A201 and Section 00800.
- B. Basis of Design: "BondKap Attachment System" as manufactured by FilmFastener LLC, Odessa, FL, Tel: # 813.926.8721; www.filmfastener.com / www.bondkap.com; or approved equal.

2.2 CLEAR MICROLAYERED SAFETY AND SECURITY WINDOW FILM

- A. Clear Microlayered Safety and Security Window Film: 3M Ultra S140 Safety and Security Window Film.

1. Physical / Mechanical Performance Properties:
 - a. Film Color: Clear.
 - b. Thickness: Nominal 14.0 mils (0.36 mm), comprised three laminated layers of optically clear polyester and contain a durable abrasion resistant coating over one surface.
 - c. Tensile Strength (ASTM D 882): 25,000 psi.
 - d. Break Strength (ASTM D 882) 25,000 psi (350 lbs. Per inch width)
 - e. Percent Elongation at Break (ASTM D 882): >125%
 - f. Percent Elongation at Yield (ASTM D882): greater than 100%.

2. Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.

3. Variation in Total Transmission Across the Width: Less than 2 percent over the average at any portion along the length.

4. Identification: Labeled as to Manufacturer as listed in this Section.

5. Solar Performance Properties: Film applied to 1/4 Inch (6.4 mm) thick clear glass.
 - a. Visible Light Transmission (ASTM E 903): 85 percent.
 - b. Visible Reflection (ASTM E 903): Not more than 10 percent.
 - c. Ultraviolet Transmission (ASTM E 903): Less than 1 percent.
 - d. Solar Heat Gain Coefficient (ASTM E 903): 0.78.

6. Impact Resistance for Safety Glazing: Tested on window glass.
 - a. Shall pass a 400 ft-lb impact when tested according to 16 CFR CPSC Part 1201 (Category 2) and ANSI Z97.1 (Class A, Unlimited).

7. Bomb Blast Mitigation:
 - a. GSA Rating of "3B" (Low Hazard) with minimum blast load of 10 psi overpressure and 89 psi*msec blast impulse.

8. Impact Protection per ASTM's E1888 / E1996:
 - a. Film shall pass impact of Medium Large Missile "C" and withstand subsequent pressure cycling at 50 psf Design pressure with use of 3M Impact Protection Adhesive attachment system.

9. Impact Protection Adhesive: Structural "wet glaze" film attachment system. Weatherable UV resistant polymer, moisture curable. Low VOC content and low odor.
 - a. Properties, as supplied:
 - 1) Color to closely match the existing glazing framing system:
 - a) Black
 - b) White
 - 2) Typical Cure Time: 3 – 7 days (25°C, 50% RH)
 - 3) Full Adhesion: 7 – 14 days
 - 4) Tack-Free Time (ASTM D 5895): 21 minutes (25°C, 50% RH)
 - 5) Flow, Sag or Slump (ASTM D 2202): 0 inches
 - 6) Specific Gravity: 1.4
 - 7) Working Time: 10 – 20 minutes (25°C, 50% RH)
 - 8) VOC Content: 16 g/L

- b. Uniformity: Product shall have uniform consistency and appearance, with no clumping.
 - 1) Contractor shall use "painters type" tape to maintain a uniform installation of IPA on the glazing metal frame.
- c. Identification: Labeled as to Manufacturer as listed in this Section.
- d. On various installation conditions, the glazing stop can have various profile(s). The contractor shall ensure that the IPA is installed a minimum dimension as indicated above and in accordance with the manufacturer's printed instructions.

2.3 BONDKAP ATTACHMENT SYSTEM

- A. Basis of Design - BondKap Attachment System: Weatherable Rigid PVC secured using approved structural silicones such as Dow Corning 995 or GE SCS2000 "Wet Glaze" type attachment. BondKap aids in the integrity of the silicone to maintain proper alignment and increases the tensile/tear strength of the silicone, while provided and aesthetic cover to an unsightly large bead of silicone.
 - 1. BondKap, BK 2001.
 - a. Width: 1.516 inches.
 - b. Typically used for commercial storefront applications where added protection is necessary such as high profile faculities.
 - 2. BondKap, BK 2004.
 - a. Width: 1.30 inches.
 - b. Typically used for commercial storefront applications.
 - 3. BondKap, BK2005.
 - a. Width: 2.588 inches.
 - b. Typically used for commercial storefront doors.
 - 4. BondKap, BK 2006.
 - a. Width: 1.78 inches.
 - b. Typically used for commercial storefront doors.
 - 5. Material properties.
 - a. Full cure of silicone 30 to 60 days depending on BondKap profile.
 - b. Strength and elongation dependent upon silicone used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. If preparation of glass surfaces is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
 - 1. Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance:

- B. Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- C. At the request of the specifying authority, an adhesion test to the frame surface may be conducted by applying a 4 - 6 inch long bead, approximately 0.5 – 1 inch in width, masking one side of the frame surface underneath the strip with tape. Allow the Impact Protection Adhesive to cure for 7 days and test adhesion by pulling up on the masked end and a 90 degree angle. If cohesive failure is observed (adhesive residue left behind on the frame surface), adhesion is acceptable; if adhesive failure is observed (clean peel from the frame), adhesion is unacceptable and product is not recommended.
- D. Commencement of installation constitutes acceptance of conditions.
- E. BondKap Examination.
 - 1. Assure the BondKap is the correct length, color and profile for the installation.
 - 2. Assure the BondKap has not been subject to direct sunlight and has warped. If damage has occurred replace as necessary. BondKap will not warp once properly installed and has full adhesion with the structural silicone.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Pre-cut the BondKap strips as directed from the manufacturer.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions (See attached 3M Impact Protection Adhesive Attachment System document).
 - 1. Install film on surface 2 (single pane glass).
- B. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant. Use new blade tips after 3 to 4 cuts.
- C. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
- D. Apply film to glass and lightly spray film with slip solution.
- E. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- F. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.

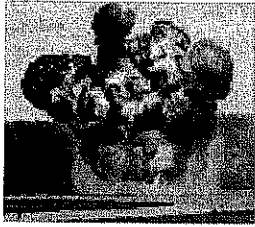
- G. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.
- H. Recommended minimum bead overlap for blast mitigation is 0.5 inch on both film and frame surfaces (excluding the glazing stops or compression gaskets).
- I. To ensure a straight and consistent bead width is achieved, masking tape may be applied to film and frame surfaces before application of 3M Impact Protection Adhesive.
- J. Dispense Impact Protection Adhesive with a caulk gun and nozzle having an opening cut to approximate size of desired bead width.
 - a. Install as specified by silicone manufacturer and BondKap manufacturer.
 - b. Cut the tip of the silicone the appropriate size for the BondKap in use.
 - c. Apply the silicone to the frame and glass or on the BondKap depending on which profile is in use.
 - d. Place the BondKap on the silicone at the specified angle to achieve maximum contact with silicone frame and glass.
 - 1) If alternative BondKap selection is used and silicone has been applied to the BondKap, press the silicone BondKap combination to the desired position on the glass and frame.
 - e. Apply sufficient pressure to assure silicone is mated to BondKap, glass and frame. You should be able to perceive the silicone under the BondKap. If not lift the BondKap and apply more silicone. If an excess of silicone is protruding past the BondKap see cleaning and protection.

3.4 CLEANING AND PROTECTION

- A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.
- D. Common window cleaning solutions may be used 30 days after installation.

END OF SECTION 08870

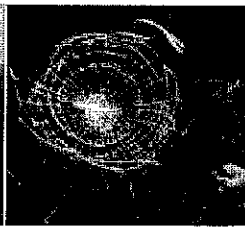
3M™ Impact Protection Adhesive Attachment System Installation Instructions



Bomb Blast



Windstorm

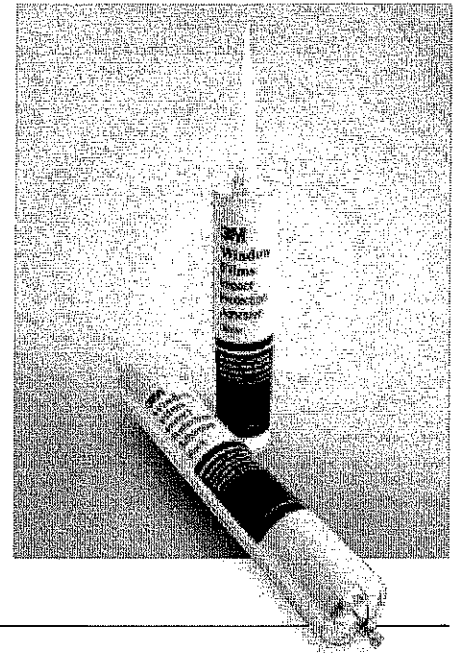


Forced Entry/Smash and Grab

3M™ Impact Protection Adhesive improves the overall performance of 3M™ Safety and Security Window Films. This unique window protection system combines the toughness of 3M's patented micro-layer safety film with 3M's world-class expertise in adhesives to help shield against impact energy from severe weather*, earthquakes, bomb blasts or forced entry events. The 3M Impact Protection System also helps protect against personal injury from flying glass.

3M Impact Protection Adhesive:

- Commercial and Residential Applications
- Bomb Blast and Windstorm Testing results available upon request



The following procedure describes the materials and steps that are necessary to install the 3M™ Impact Protection Adhesive attachment system.

Recommended Products:

- 3M™ Citrus Base Cleaner
- 3M™ Adhesive Remover, Citrus Base
- 3M™ Foaming Glass Cleaner
- 3M™ Super Fine Synthetic Steel Wool Pad
- 3M™ Scotch™ Safe Release™ Masking Tape
- 3M™ Scotch™ Long Mask™ Masking Tape
- 3M™ Impact Protection Adhesive
- 3M™ 94 Tape Primer

Window Preparation

Glass panel shall be uniform in appearance. No fractures, holes or what is considered contaminated glass, or damaged glass, to be present.

Window frame to be uniform in appearance and free from dents, holes and cracks within two inches of the glass.

A thorough cleaning of the glazing and frame systems before applying film and attachment is required to remove all foreign matter and contaminants such as adhesives, grease, oil, dust, water, surface dirt, old sealant or glazing compounds by using 3M Citrus Base Cleaner, alcohol or commercial cleaning solution.

Detergent or soap and water treatments are not recommended for this step.

1. IPA does not require the glazing stop to be trimmed. **Note: If the glazing stop overlaps frame, trimming the glazing stop is optional (Reference Detail 1 on back).**
2. Spray the glazing bead, glass and frame surface with an appropriate cleaning product and remove with a lint free cloth. Repeat if necessary to remove all foreign materials from the glass and inside window frame surfaces. If the area is particularly dirty, a light scrub with a 3M 0000 Super Fine Synthetic Steel Wool Pad is recommended to loosen contaminants. Finish with a final cleaning if needed.
3. Spray the glass with 3M Foaming Glass Cleaner or a soap and water solution. Flush the glazing bead to glass area starting at the top and working down to drain or remove any remaining contaminant from the area. Scrape the glass with a razor to remove all foreign matter. Thoroughly clean the glass a final time with soapy water and a window cleaning squeegee. Wipe around the glazing bead and frame area one final time to remove all of the soap and water solution.

Film Installation

1. Apply the 3M™ Ultra Safety & Security Window Film to the glass, making sure that the film is installed as far into the glazing channel as possible. Cut film as you normally would around the remaining glazing bead. **Remember to leave enough spacing between film and glazing bead to facilitate the removal of the slip solution.**
2. Squeegee the film to the glass by pressing firmly to remove as much of the slip solution as possible, especially at the edges of the film. **Two "edge-drying" methods can be used before applying the Impact Protection attachment system.**
 - A. The panels can be left for a few weeks to ensure proper drying of the film before the IPA system is applied.

— OR —

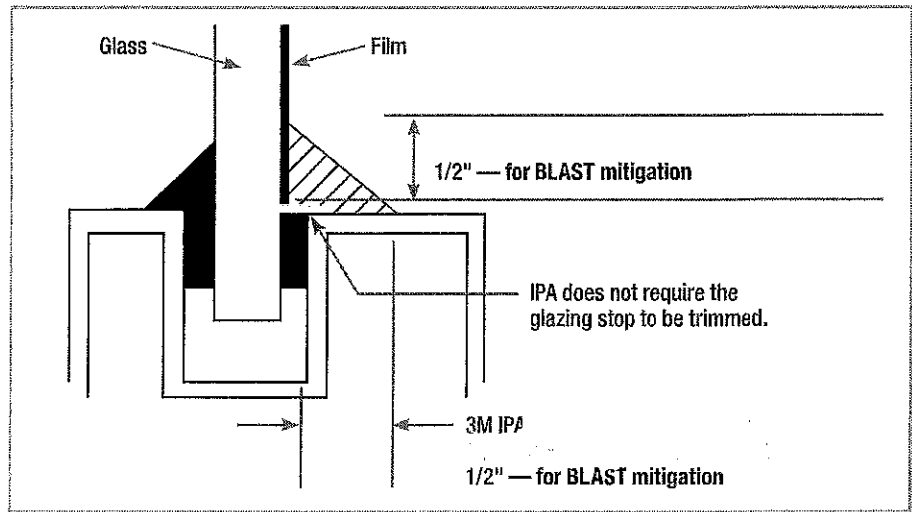
 - B. Using a hair dryer, gently heat and bump the edges of the film to hasten the removal and drying of the water from the edges. **Make sure that all of the soap and water solution has been removed from the film/glass/glazing channel before applying the IPA attachment system.**

3M

Impact Protection Adhesive Installation

1. Clean and prime window frame prior to installing the 3M™ Impact Protection Adhesive (IPA). To clean the frame, wipe area using a cloth dampened with a citrus-based cleaner. Then clean same area using a cloth dampened with an ammonia-based glass cleaner. Allow at least 5 minutes before applying the 3M IPA. If window frame is painted (latex, oil, polished or powder coated), 3M™ 94 Tape Primer is required in the area that IPA will be applied.
2. Apply a 1" (25mm) strip of 3M™ Scotch™ Safe Release™ White Masking Tape to the ultra film surface 3/8" (9mm) in from the edge of the film to all four sides. **Note:** This dimension will depend on application—1/2"
3. Apply a 1" (25mm) strip of 3M Safe Release Blue Masking Tape to the window frame 3/8" (9mm) from the edge of the trimmed gasket. This will form a parallel sealant channel that will allow a uniform sealant bead to be applied to the glass/frame interface. **Note:** Use a clean drop cloth before proceeding to Step 3.
4. Apply a triangular bead of IPA Impact Protection Adhesive, and tool as needed to form an acceptable finish. Refer to Figure 1. **Read and follow all product information and installation instructions provided by 3M Company.** We recommend you start in a corner and apply the sealant bead out approximately 6". Then turn the gun and push the sealant bead to the next corner where the same method is repeated. **Pushing the sealant bead will insure proper penetration and minimize the chances of air gaps in the bead.** Pulling the gun can also be done if confident no air gaps are formed.

Detail 1. 3M™ IPA System Typical Configuration



5. Smooth the sealant bead with an appropriate tool, if necessary, to give a finished look. Tooling should be completed in one continuous stroke immediately after adhesive application and before a skin forms.
6. Carefully remove the two masking strips from the glass/frame immediately after tooling. Do not allow the excess adhesive to contact the film, frame or flooring surfaces. A light colored drop cloth is needed to protect the work area. **Be careful not to step on adhesive and transfer it to surrounding surfaces.**

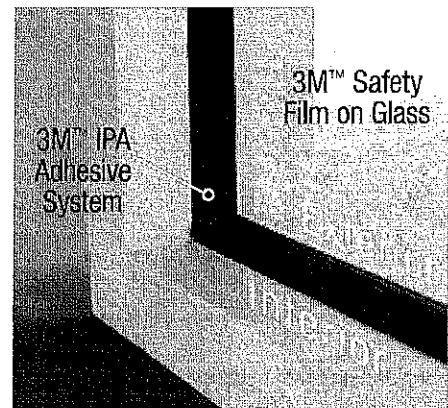
Note: Should you get some of the adhesive on the surrounding surfaces, an application and gentle wipe with a 3M Citrus Based Cleaner is recommended.

Curing time for the IPA will vary depending on temperature and relative humidity. It is not recommended to clean the film/IPA system for at least 36 hours following the installation. Full curing adhesion can take up to 7 days, depending on conditions.

Table 1

| Property | Test Method Used | Units | 3M IPA |
|--|------------------|-----------|------------|
| Curing Time (25°C (77°F), 50% RH) | | days | 3-7 |
| Full Adhesion | | days | 7-14 |
| Tack-Free Time (25°C (77°F), 50% RH) | ASTM D5895 | minutes | 21 |
| Flow, Sag or Slump | | inches | 0 |
| Working Time (25°C (77°F), 50% RH) | | minutes | 10-20 |
| Specific Gravity | | n/a | 1.403 |
| VOC content | | g/L | 16 |
| As Cured—After 21 Days at 25°C (77°F), 50% RH | | | |
| Ultimate Tensile Strength | ASTM D0412 | psi (Mpa) | 380 (2.62) |
| Ultimate Elongation | ASTM D0412 | % | 640 |
| Durometer Hardness, Shore A | ASTM D2240 | points | 38-39 |
| Tear Strength, Die B | ASTM D0624 | ppi | 72 |

Bomb Blast and Windstorm Testing results available upon request.



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3M Renewable Energy Division
3M Center, Building 235-2S-27
St. Paul, MN 55144-1000
www.3M.com/windowfilm

IMPORTANT NOTICE: This product is not approved in the State of Florida for use as hurricane, windstorm, or impact protection from wind-borne debris from a hurricane or windstorm. In compliance with Florida Statute 553.842, this product may not be advertised, sold, offered, provided, distributed, or marketed in the State of Florida as hurricane, windstorm, or impact protection from wind-borne debris from a hurricane or windstorm.

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SECTION 09250 - GYPSUM DRYWALL

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. Extent of each type of gypsum drywall construction required is indicated on the drawings.
- B. This Section includes the following types of gypsum board construction:
 - 1. Gypsum drywall including screw-type metal support system
 - 2. Impact resistance gypsum wallboard
 - 3. Drywall finishing (joint tape and compound treatment)
 - 4. Vinyl trim and accessories.
 - 5. Knee Wall Brace Kit.
- C. Related Sections:
 - 1. Section 09900 - Painting

1.3 QUALITY ASSURANCE

- A. Manufacturer: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.
- B. Fire-Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction.
 - 1. Provide fire-resistance-rated assemblies identical to those indicated by reference to GA File No's. in GA-600 "Fire Resistance Design Manual" or to design designations in U.L. "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.
- C. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.
- D. Fireblocking and Draftstopping: Comply with the International Building Code requirements for installation of fireblocking and / or draftstopping, to prevent the fire passage of flame and product of combustion through concealed spaces or openings in gypsum board systems, in the event of fire.
- E. Provide self extinguishing vinyl trim accessories which do not support combustion once flame source is removed.

1.4 REFERENCES

- A. ANSI/ASTM C 840 Gypsum Board Standard - Comply with applicable requirements for application and finishing of gypsum board, unless otherwise indicated.
- B. ASTM C 1396 Gypsum Wallboard Standard:
- C. ASTM C 754 Steel Framing Standard - Comply with applicable requirements for installation of steel framing for gypsum board.
- D. ASTM C11: Gypsum Board Terminology Standard:
- E. ASTM C 1278 Impact Resistance Gypsum Wallboard:
- F. ASTM D 1784 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPCV) Compounds
- G. ASTM D 3678 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Interior-Profile Extrusions.
- H. Application and Finishing of Gypsum Panel Products: GA-216.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.
 - 1. Provide product data for impact resistance gypsum wallboard system.
- B. Shop drawings: Submit shop drawings for wall metal stud framing for drywall shaft system and structural heavy gauge wall studs supporting other equipment, items, cabinets, etc.
 - 1. Show layout, spacings, sizes, thicknesses, and types of metal framing, fabrication, fastening and anchorage details, including mechanical fasteners.
 - 2. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachments to other units of Work.
 - 3. Indicate manufacturer's design thickness to meet structural performance requirements for each wall mounted item, equipment, cabinet, etc.
- C. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
- C. Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
 - 1. Minimum Room Temperatures: When ambient outdoor temperatures are below 55°F maintain continuous, comfortable building working temperature of not less than 55°F for 48 hours prior to application and continuously thereafter until drying is complete.
 - 2. Ventilate building spaces as required to remove water in excess of that required for drying joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.
 - 3. The gypsum drywall shall be installed only when the exterior walls have been erected, windows installed and the permanent roof is installed and in watertight condition to prevent the growth of mold. The contractor shall not install gypsum drywall panels that are wet, have the indication of mold, including but not limited to: fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:
- B. Metal Support Systems:
 - 1. Allied Structural Industries
 - 2. Clark-Dietrich Building Systems
 - 3. National Gypsum Company
 - 4. Marino\WARE; a Div. of WARE Industries, Inc.
 - 5. United States Gypsum Co. (USG)
 - 6. Or approved equal

C. Gypsum Boards and Related Products:

1. CertainTeed Gypsum.
2. Georgia-Pacific Corp.
3. Gold Bond Building Products Div., National Gypsum Co.
4. United States Gypsum Co.
5. Continental Building Products
6. Or approved equal

D. Impact Resistance Gypsum Wallboard:

1. United States Gypsum Co. (USG)
2. National Gypsum Co.
3. Georgia-Pacific Gypsum, LLC
4. Continental Building Products
5. CertainTeed Gypsum.
6. Or approved equal

E. Vinyl Trim

1. Trim-Tex,
2. Or approved equal.

2.2 METAL SUPPORT MATERIALS

A. General: Provide components which comply with ASTM C754 for materials and sizes, unless otherwise indicated.

B. Wall/Partition Support Materials

1. Studs ASTM C645, 25 gauge unless otherwise indicated. 20 gauge minimum at door jambs and wherever structural or other gauge studs are called for, for use with impact resistant type gypsum wallboard, and to comply with applicable published instructions and recommendations of gypsum board manufacturer or, if not available, of "Gypsum Construction Handbook" published by United States Gypsum Company.
 - a. Depth of Section: 3-5/8 inch, unless indicated otherwise.
 - b. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.
 - c. Provide structural heavy gauge studs and bracing to support loads of wall mounted items, equipment, cabinets, etc. coordinate with other trades for weight requirements and mounting locations.
2. Furring Members: ASTM C645, 25 gauge hat-shaped.
3. Fasteners for Stud Members: Provide fasteners of type, material, size, recommended by furring manufacturer for the substrate and application indicated.

C. Knee Wall Brace Kit:

1. Basis of Design: "SKB" Knee Brace Kit as manufactured by Pittcon Softforms® LLC, Tel.# 800.637.7638 / 301.927.1000; or approved equal.
2. The welded steel assembly consists of a 2" x 2" steel tube, 1/8" thick wall and a 3½" x 5" x 1/4" thick steel base plate with four (4) holes of 7/16" diameter. The assembly shall be painted with a flat black primer providing a corrosive resistant surface compatible with plaster, joint compounds and interior finishes.
 - a. Manufacturer recommends anchoring the base plate using 3/8" x 3½" masonry fasteners with expanded shields for mounting in concrete floor.

2.3 GYPSUM BOARD

A. General: ASTM C1396, in maximum lengths available to minimize end to end joints.

1. Type: Regular, unless otherwise indicated. Type X for fire resistance rated assemblies and where indicated.
2. Edges: Tapered.
3. Thickness: 5/8 inch, unless otherwise indicated.

B. Impact Resistance Gypsum Wallboard: ASTM C1629 level 3 (highest) for hard- and soft-body impact, and tested in accordance with ASTM C473 for moisture and mold resistance and ASTM D3273 for resistance to growth of mold on the surface of interior coatings. Mold Defense per ASTM D3273. Provide Type X; tapered edge, 5/8 inch thick, unless otherwise indicated.

1. Basis of Design: "Mold Tough VHI Firecode Core" High-Impact-Resistant Panels with Moisture and Mold Resistance; United States Gypsum Co.; or approved equal.
2. Subject to compliance with requirements of the Contract Documents, manufacturers offering products which may be incorporated in work include the following:
 - a. "Hi-Impact XP", by National Gypsum.
 - b. "Extreme Impact Resistant Gypsum Drywall, by CertainTeed Gypsum.
 - c. Or approved equal.

2.4 TRIM ACCESSORIES

- A. General: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim beads, J-type edge trim beads, special L-kerf type edge trim beads, and one-piece control joint beads.
- B. Semi-Finishing Type: Manufacturer's standard trim units which are not to be finished with joint compound (non-beaded), where indicated.

2.5 JOINT TREATMENT MATERIALS (GYPSUM BOARD APPLICATION)

- A. General: Provide materials complying with ASTM C475, ASTM C840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.
- B. Joint Tape: Manufacturer's recommended types for indicated applications. Use types compatible with joint compounds.
- C. Joint Compounds: Provide manufacturer's recommended types for indicated applications.
 - 1. For interior repair and patching work, provide chemical-hardening-type for bedding and filling, ready-mixed vinyl type or vinyl type powder type for topping.

2.6 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum drywall construction which comply with referenced standards and the recommendations of the manufacturer of the gypsum board.
- B. Gypsum Board Screws: ASTM C954 or ASTM C1002.
- C. Acoustical Sealant: Water base type, non-drying, non-bleeding, non-staining type; permanently elastic, as recommended by gypsum board manufacturer.
 - 1. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant, [with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.
 - 2. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), recommended for sealing interior concealed joints to reduce airborne sound transmission.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION OF METAL SUPPORT SYSTEMS

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions

have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.

1. Furnish concrete inserts and other devices indicated, to other trades for installation well in advance of time needed for coordination with other construction.

3.3 INSTALLATION OF METAL SUPPORT SYSTEMS

- A. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members or as indicated.
- B. Provide furring and shims as required to install new work over existing substrates so that new work will be installed plumb, level and true.
- C. Wall-Partition Support Systems:
 1. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer or, if not available, of "Gypsum Construction Handbook" published by United States Gypsum Company.
 2. Isolate non-load bearing steel stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
 - a. Install single deep-leg deflection tracks and anchor to building structure.
 - b. Connect drift clips to cold-formed metal framing and anchor to building structure.
 3. Install runner tracks at floors, ceilings and structural walls and columns where gypsum drywall stud system abuts other work, except as otherwise indicated. Ramset to precast plank.
 4. Extend partition stud system through acoustical ceilings and elsewhere as indicated to the structural support and substrate above the ceiling.
 5. Frame door openings with vertical studs securely attached by screws at each jamb either directly to frames or to jamb anchor clips on door frame; install runner track sections (for jack studs) at head and secure to jamb studs.
 6. Space studs 16 inches o.c. except as otherwise indicated.
 7. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
 8. Frame openings other than door openings in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.
 9. Provide runner tracks of same gauge as jamb studs. Space jack studs same as partition studs.

10. Cut studs 1/2" short of full height to provide perimeter relief.
11. Do not fasten studs to top track to allow independent movement of studs and track.
12. Door jambs:
 - a. Install double 20 gauge studs at each jamb for all doors.
 - b. Space wall furring members 16 inches o.c. except as otherwise indicated.

3.4 APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL

- A. Pre-Installation Conference: Meet at the project site with the installers of related work and review the coordination and sequencing of work to ensure that everything to be concealed by gypsum drywall has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed.
- B. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.
- C. Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible.
- D. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.
- E. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- F. Attach gypsum board to framing and blocking provided for additional support at openings and cutouts.
- G. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.)
- H. Form control joints and expansion joints at locations indicated (@ 30'-0" o.c. or 900 sf), with space between edges of boards, prepared to receive trim accessories.
- I. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.
- J. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum board over wood framing, with "floating" internal corner construction.
- K. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.5 METHODS OF GYPSUM BOARD APPLICATION

- A. Single-Layer Application: Install gypsum wallboard as follows:
 - 1. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.

3.6 INSTALLATION OF DRYWALL TRIM ACCESSORIES

- A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.
- B. Install corner beads at external corners.
- C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound. Install "L" type trim where drywall construction is tightly abutted to other construction and install special kerfed type where other work is kerfed to receive long leg of "L" type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).
 - 1. Install J-type semi-finishing trim where indicated, and where exterior gypsum board edges are not covered by applied moldings.
- D. Install metal control joint (beaded type) where indicated or required.

3.7 FINISHING OF DRYWALL

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.
- B. Prefill open joints and rounded or beveled edges, if any, using setting-type joint compound.
- C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
- D. Apply joint compounds in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat.
- E. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840 and GA-214-07:
 - 1. **Level 1** In plenum areas above the ceiling, areas concealed in the building (does not typically meet fire-resistant assembly requirements).
 - 2. **Level 5** Finish for areas that are to receive gloss, semi-gloss, enamel or non-textured flat paints.

3.8 IMPACT RESISTANCE GYPSUM WALLBOARD INSTALLATION

- A. General: Install fiber reinforced gypsum wallboard according to manufacturer's instructions and GA-216 "Application and Finishing of Gypsum Board."
 - 1. Nails and Screws: Corrosion resistant; ASTM C 840.
 - 2. Adhesives: Manufacturer's approved adhesive types.
 - 3. Accessories: Similar to indicated gypsum wallboard application.
 - 4. Joint Tape, Taping Compound and Finishing Compound: Comply with ASTM C 475.

3.9 CLEANING AND PROTECTION

- A. Remove temporary coverings used to protect other work.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall construction being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09250

SECTION 09650 - RESILIENT FLOORING

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 DESCRIPTION OF WORK

- A. Extent of resilient flooring and accessories is shown on drawings and in schedules.
 - 1. Vinyl composition tile (VCT).
 - 2. Rubber resilient wall base.
 - 3. Rubber stair treads.
 - 4. Rubber stringers.
 - 5. Resilient edge strips.

1.3 RELATED SECTIONS

- A. Section 01455 - Concrete In-situ Relative Humidity and pH Testing.
- B. Section 03300 - Cast in Place Concrete Slabs on Grade.
- C. Section 03450 - Self-Drying Finishing Underlayment.
- D. Section 05400 - Miscellaneous Structural Steel.
- E. Section 05500 - Metal Fabrications.
- F. Section 07900 - Joint Sealer Assemblies.
- G. Section 09682 - Carpet Entry Mat (CEM).

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ASTM F 2170-11 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
 - 2. ASTM F 1869-11 Standard Test Method Using Anhydrous Calcium Chloride.
 - 3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - 4. ASTM F 1861 Type TS, Group 1 Performance Requirements for Resilient Rubber Wall Base.

5. ASTM F 137 Standard Test Method for Flexibility of Resilient Flooring Materials protocol for Resilient Rubber Wall Base.
 6. ASTM F 1515 Standard Test Method for Measuring Light Stability of Resilient Flooring protocols for Resilient Rubber Wall Base.
 7. ASTM F 2169 Standard Specification for Resilient Stair Treads, Type TS, Class 1 and 2, Group 1 and 2.
 8. ASTM D 2240 Not less than 85 Shore A.
 9. ASTM D 3389 Abrasion Resistance: less than 1 gram weight loss.
 10. ASTM D 2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of 0.6 or greater.
 11. ASTM E 648 Standard Test Method for Critical Radiant Flux of 0.45 watts/cm² or greater, Class I.
- B. Moisture vapor emission testing in accordance with ASTM F 1869-11. Test results should not exceed 3 pounds per 1,000 square feet per 24 hours, unless otherwise specified by the flooring or adhesive manufacturer.
1. ASTM Standard also states that relative humidity inside of the concrete slab should not exceed 75%, per ASTM F2170-11, unless otherwise specified by the flooring or adhesive manufacturer.
- C. Manufacturer: Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.
1. Wherever possible, provide each type of required resilient flooring and accessories produced by a single manufacturer.
- D. Fire Test Performance: Provide resilient flooring which complies with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.
1. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, Class A, Smoke <450.
 2. ASTM E648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm² or greater, Class 1.
- E. Coefficient of Friction: The Federal and industry standard for testing coefficient of friction or the slip resistance of a surface is tested to the requirements, as outlined, in ASTM D-2047, which utilizes a friction measurement machine, commonly referred to as the James Machine.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of resilient accessory.

- B. Samples for Verification Purposes: Submit the following samples in triplicate of each type, color, and pattern, showing full-range of color and pattern variations.
 - 1. Full size tile samples.
 - 2. For initial selection of colors and patterns submit, prior to above, samples in form of actual sections of resilient flooring, including accessories, showing full range of colors and patterns available, for each type of resilient flooring required.
- C. Certification for Fire Test Performance: Submit certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient flooring complies with fire test performance requirements.
- D. Testing of Substrate:
 - 1. Submit test reports of testing the concrete or other floor substrate, indicating compliance with manufacturer's requirements for moisture and alkalinity percentage of contents. Tests shall be performed in accordance with requirements of Section 01455.
- E. Maintenance Instructions: Submit 2 copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.
- F. Replacement Material: After completion of work, deliver to project site 2% of replacement materials from same manufactured lot as materials installed.
 - 1. Tile flooring, not less than one box for each 50 boxes or fraction thereof, for each type, size and color installed.

1.6 PROJECT CONDITIONS

- A. Maintain minimum temperature of 65°F (18°C) or more than 85°F (29°C) in spaces to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation.
 - 1. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation.
- B. Maintain the ambient relative humidity between 40% and 60% during installation.
- C. Install resilient flooring and accessories after other finishing operations, including painting, have been completed.
- D. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55°F (13°C) or more than 85°F (29°C).
- E. Do not install resilient flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturers and their recommendation for bond and maximum levels of moisture and pH per testing as performed under requirements of Section 01455.

1.7 WARRANTY

A. Vinyl Composition Tile (VCT):

1. Manufacturer warrants its regular (first quality) commercial floor products to be free from manufacturing defects for **five (5) years** from date of purchase.
 - a. **Within One(1) Year** of Purchase: If a defect covered by this warranty is reported to Manufacturer in writing within one(1) year of purchase, Manufacturer will replace/repair at its discretion the defective product including reasonable labor charges for installation. Manufacturer will replace it with similar quality first grade material or repair the defect. The replaced or repaired material is warranted for the time then remaining under this original Warranty.
 - b. **Within Two(2) Years** of Purchase: If a defect covered by this warranty is reported to Manufacturer in writing within two(2) years of purchase, Manufacturer will replace or repair at its discretion the defective product and pay 50% of a reasonable labor charge for installation.
 - c. **After Two(2) Years** of Purchase: If a defect covered by this warranty is reported to Manufacturer in writing after two(2) years but within ten(10) years of purchase, Manufacturer will replace or repair at its discretion defective material only (excluding cost of installation).
 - d. Otherwise: **Within Five(5) Years** of Purchase: Installation is not according to Manufacturer's Engineered Installation Systems. If a defect covered by this warranty is reported to Manufacturer in writing within five(5) years of purchase, Manufacturer will replace or repair at its discretion defective material only (excluding cost of installation).
 - e. Manufacturer does not warrant the installers' workmanship. Workmanship errors should be addressed to the contractor who installed the floor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include but not limited to the following:
 1. Vinyl Composition Tile (VCT); provide the following:
 - a. "Standard Excelon Imperial Texture" and "Standard Excelon MultiColor", as manufactured by Armstrong World Industries;
 - b. "Essentials, Designer Essential and Inspiration", as manufactured by Mannington Commercial;
 - c. "Cortina Classics", as manufactured by Johnsonite (a Tarkett Co., Azrock Collection);
 - d. Or approved equal.

2. Rubber Stair Treads with Risers:
 - a. #96 vantage tread with riser, as manufactured by Roppe Corporation.
 - b. "Flecksibles ", as manufactured by Endura Rubber Flooring,.
 - c. "Rubber Integrated Stair Tread with Riser" as manufactured by Johnsonite.
 - d. Or approved equal.

3. Rubber Resilient Wall Base and Accessories:
 - a. "Pinnacle", as manufactured by Roppe Corporation;
 - b. "BaseWorks Thermoset Rubber Wall Base", as manufactured by Johnsonite,
 - c. "RubberMyte" as manufactured by Burke Mercer Flooring Product,
 - d. Or approved equal.

4. Rubber Stringers @ stairs without structural steel stringer:
 - a. Products as manufactured by: Johnsonite, Roppe, or approved equal.

- B. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.
 1. The use of one manufacturer's catalog numbers, and the specific requirements set forth in drawings and specifications, are not intended to preclude the use of other products by other manufacturer's or which may be equivalent, but are given for the purpose of establishing a standard of design and quality for materials, construction and workmanship.

- C. Comparable products of other manufacturers will be considered if it can be clearly shown that their products are equal to or will exceed the construction quality requirements, intended performances and all other design attributes listed above and provided that deviations in dimensions and profiles are minor and do not materially detract from the design concept or intended performances as judged solely by the Architect/Owner.

2.2 VINYL COMPOSITION TILE FLOORING

- A. Vinyl Composition Tile: ASTM F 1066, Class 2, through pattern, 12" x 12" unless otherwise indicated, and as follows:
 1. Asbestos-free.
 2. Gauge: 1/8 inch.

- B. Provide vinyl composition tile to meet indicated "Basis of Design" products and quality assurance requirements indicated in Articles 1.2 and 2.1 of this specifications.

2.3 ACCESSORIES

- A. Wall Base: Provide rubber base complying with ASTM F-1861, Type TS, Group 1. Vulcanized SBR rubber with matching preformed corner units, and as follows:
 1. Height: 4-inches, unless otherwise indicated on the drawings.
 2. Thickness: 1/8 inch gauge.
 3. Style: Standard top-set cove.
 4. Finish / Colors: Matte finishes in colors as selected by Architect from manufacturer's

- available full range of colors. Allow for more than one color in any given area.
5. Color Stability: Meets or exceeds ASTM F 1861 requirements for color stability when tested to ASTM F 1515 Standard Test Method for Measuring Light Stability of Resilient Flooring protocols.
 6. Phthalate, chlorine and halogen free.
- B. Resilient Edge Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bullnose edge, color to match flooring, or as selected by Architect from manufacturer's available full range of colors; not less than 1" wide.
- C. Resilient Stair Treads: Provide treads where shown, consisting of single-piece units for width of stair treads.
1. Units shall comply with Americans with Disabilities Act regulations,
 2. Meet building code standards from American National Standards Institute.
 3. Meet standards of American Society for Testing and Materials.
 4. Meet flammability requirements of the National Fire Protection Association Life-Safety Code 101.
 5. Product is PVC free and recyclable.
 6. Provide rubber stair tread units shall comply with FS RR-T-650, Type A, sanded backs, chamfered edge raised profile of geometric form, with raised profile surface pattern.
 - a. Thickness: Not less than 3/16" nominal and 1/4" at nosing.
 - b. Nose Design: Class 1 - square
- D. Rubber Stringers: Provide product for field measure, template preparation, cutting and installation.
1. Height: 10".
 2. Thickness: 0.100" nominal.
- E. Adhesives (Cements): Water resistant, stabilized type as recommended by flooring manufacturer to suit material and substrate conditions.
1. Adhesives to be used for resilient floor applications shall not generate any odor or unpleasant smell.
- F. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- G. Leveling and Patching Compounds: Latex types as recommended by flooring manufacturer.

2.4 COLORS, TEXTURES AND PATTERNS

- A. Colors, textures and patterns shall be as selected and directed by the Architect. Patterns shall be defined as using not more than five (5) different colors of tile in any given area, applied in boarders, stripes, diagonals, checkerboard patterns and other designs as indicated, or if not indicated, shall be as directed by the Architect.
1. All selections shall be made from manufacturer's full product lines, for all products and accessories, (including premium textures and colors).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Inspect substrates and conditions of installation to verify that work may properly commence. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Concrete Substrates: Perform concrete relative humidity and pH testing and to comply with manufacturer's recommended moisture tests before beginning installation, to verify that concrete surfaces have cured sufficiently to allow adhesive bond to resilient flooring.
 - 1. Commencement of work shall constitute acceptance of conditions. Any necessary remedial work required to correct any unsatisfactory conditions, found after the start of installation, will be provided at no cost to the Owner.

3.2 PREPARATION

- A. Perform moisture content testing as required by manufacturer's instructions to ensure pH readings and moisture transmission are acceptable. Perform testing in accordance with requirements of Section 01455.
 - 1. If values exceed this level, follow manufacturer's recommendations for moisture transmission mitigation. Do not proceed until unsatisfactory conditions have been corrected.
- B. Broom clean or vacuum surfaces to be covered, and inspect subfloor.
 - 1. Use leveling and patching compounds as recommended by the manufacturer for filling small cracks, holes and depressions in subfloors.
 - 2. Apply concrete slab primer and/or sealer, as recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.
 - 3. Remove paint, curing compounds, and other materials that could interfere with adhesion of resilient products.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with manufacturer's published recommendations for installation in each area, extending resilient flooring into spaces which are partially concealed. Cut and fit tightly to fixtures, pipes, and other obstructions, as well as to walls and partitions.
- B. Access Covers: Install resilient flooring tightly to removable access covers in field of flooring, taking care that pattern will match when covers are in closed position.
- C. Tightly adhere resilient flooring to substrate with no open joints or cracks, and without raised or blistered areas. Spread adhesive evenly, so that final installation will be without telegraphed markings from adhesive or substrate.

- D. Extend resilient flooring into toe spaces, door reveals, and into closets and similar openings.
- E. Scribe, cut, and fit resilient flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls and partitions.
- F. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.
- G. Install resilient flooring on covers for telephone and electrical ducts, and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly cement edges to perimeter of floor around covers and to covers.
- H. Tightly cement resilient flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient flooring at perimeter of each covered area to assure adhesion.

3.4 INSTALLATION OF TILE FLOORS

- A. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.
- B. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable.
 - 1. Lay tile in pattern shown or as directed by Architect.
- C. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.
- D. Expansion Joints: Locate expansion joints and other sealant filled joints, including control, contraction and isolation joints, where indicated or where joints occur in substrate. Do not saw cut joints.

3.5 INSTALLATION OF ACCESSORIES

- A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
 - 1. Job-formed Corners:
 - a. Outside Corners: Form by bending without producing discoloration (whitening) at bends.
 - b. Inside Corners: Butt one piece to corner, then scribe next piece to fit.

- B. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
- C. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.
- D. Apply resilient accessories to stairs as indicated and in strict accordance with manufacturer's installation instructions.
- E. Rubber Stringers:
 - 1. Contractor shall make a template of cardboard or other appropriate material. Measure height and depth of each step and transfer the measurements to the template. Rough cut the template and then trim to obtain a snug fit to the staircase.
 - 2. Lay template over the stringer material and transfer the pattern using an awl onto the stringer material. Cut the stringer material and check the fit to the staircase. Trim stringer material to obtain a snug fit
 - a. Stringers are to be installed to the vertical surface prior to the stair treads, nosing and risers.

3.6 CLEANING AND PROTECTION

- A. Perform following operations immediately upon completion of resilient flooring:
 - 1. Sweep or vacuum floor thoroughly.
 - 2. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
 - 3. Damp-mop floor being careful to remove black marks and excessive soil.
 - 4. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturers.
- B. Protect flooring against damage during construction period to comply with resilient flooring manufacturer's directions.
 - 1. Apply protective floor polish to resilient flooring surfaces free from soil, excess adhesive or surface blemishes. Use commercially available metal cross-linked acrylic product acceptable to resilient flooring manufacturer.
 - 2. Protect resilient flooring against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary equipment or furnishings across floors.
 - 3. Cover resilient flooring with undyed, untreated building paper until inspection for substantial completion.

- C. Clean resilient flooring not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Clean resilient flooring by method recommended by resilient flooring manufacturer.
- D. Strip protective floor polish, which was applied after completion of installation, prior to cleaning.
 - 1. Reapply floor polish after cleaning.

3.7 EXTRA STOCK

- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
 - 1. Tile Flooring: Furnish not less than one box for each 50 boxes or fraction thereof, for each type, color, pattern and size selected and installed.
 - 2. Accessories: Furnish not less than 2% of each type, size and color selected and installed.

END OF SECTION 09650

SECTION 09682 - CARPET ENTRY MATS (CEM)

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.
- B. Related Sections:
 - 1. Section 01455 - Concrete In-situ Relative Humidity and pH Testing.
 - 2. Section 03300 - Concrete Work.
 - 3. Section 09650 - Resilient Flooring for rubber base.

1.2 SUMMARY

- A. Extent, location and details of type of carpet entry mats are indicated on the drawings and in the Finish Schedule.
- B. Work of this section includes furnishing and installation of carpet entry mats, adhesives and accessories.

1.3 DEFINITIONS

- A. Commercial CEM: CEM intended for use in commercial and public spaces with construction, fire ratings, static control and appearance appropriate for this use.

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E-648, Floor Radiant Panel (Passes)
 - 2. ASTM E-662, Smoke Density ≤ 450
 - 3. ASTM F 1869-11, Calcium Chloride Method, 5 lbs.
 - 4. ASTM D 2047, Static Coefficient of Friction: > 0.80 dry
- B. American Association of Textile Chemists and Colorists (AATCC)
 - 1. AATCC 16 - E, Lightfastness: $\geq 4.0 @ 60$ AFU's
- C. Standard Test Method for Evaluation of Dimensional Stability of Pile Yarn Floor Covering (AACHEN)
 - 1. AACHEN, Dimensional Stability: Din 54318 $<.10\%$

1.5 WARRANTY

- A. Manufacturer's standard **fifteen (15) year** warranty against excessive wear, edge ravel, backing separation, shrinking, stretching and static electricity.

1.6 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's product literature and installation instructions for type of carpeting material and installation accessory required. Include methods of installation for each type of substrate.
 - 1. Submit written data on physical characteristics, durability, resistance to fading and flame resistance characteristics and showing compliance with the contract requirements, including independent laboratory test reports.
 - 2. Include manufacturer's recommended specifications for primer, adhesive and installation instructions.
- B. Certificate of Compliance:
 - 1. Submit certified test reports that carpet meets all the performance requirements stated above in paragraph 1.4 and 1.5. Submit certified test reports that carpet meets all performance criteria.
- C. Samples:
 - 1. Submit two samples 6" x 8" of type, color, and pattern of CEM materials required.
 - a. Any alternates to specified products must be submitted for approval by the Architect.
 - 2. No carpet shipments are permitted until acceptance of final samples is given by the Architect / Owner.
- D. Shop Drawings:
 - 1. For carpeted areas submit shop drawings showing installation of carpeting, seam diagram, pattern direction, necessary installation accessories, and provisions for work of other trades. Show location of different patterns or styles of carpet. Also show locations of any threshold conditions.
 - 2. The contractor will supply reproducible prints on request, to facilitate shop drawing preparation.
- E. Maintenance Manual:
 - 1. Within sixty (60) days of awarding the Contract, submit two (2) copies of carpet manufacturer's maintenance manual, including his recommendations for the care, cleaning and maintenance programs of type of CEM.
- F. Recycling, Energy Conservation, and Reclamation Programs:
 - 1. Submit manufacturer's written certifications that all indicated programs are established and in full effect at the time of bidding.

G. Testing of Substrate:

1. Submit test reports of testing the concrete or other floor substrate, indicating compliance with manufacturer's requirements for moisture and alkalinity percentage of contents.

H. Warranties:

1. Submit Warranties as described in paragraph 1.5 (above).

I. Closeout Submittals:

1. Maintenance Data: Include maintenance procedures, recommended cleaning and stain removal materials, and recommended cleaning schedule. Include product data and Safety Data Sheets (SDS) for cleaning and stain-removal materials.
2. Installation Instructions: Include detailed installation procedures. Include modular installation procedures, adhesive type(s), trowel sizes, spread rates, open times, and Safety Data Sheets (SDS) for all adhesives.

1.7 QUALITY ASSURANCE

- A. Moisture vapor emission testing in accordance with ASTM F 1869-11. Test results should not exceed 5 pounds per 1,000 square feet per 24 hours, unless otherwise specified by the flooring or adhesive manufacturer.
1. ASTM Standard also states that relative humidity inside of the concrete slab should not exceed 80%, per ASTM F2170-11, unless otherwise specified by the flooring or adhesive manufacturer.
- B. Single Source Responsibility: Provide products from a single manufacturer.
- C. Warranties must be manufacturer's standard and not job specific.
- D. All styles must come from the same manufacturer.
- E. Do not install carpet until areas have been fully enclosed and environmental conditions have reached the levels indicated during occupancy.
- F. Maintain ambient temperature and humidity conditions during and after installation of carpet at levels indicated during occupancy.
- G. Allow carpet to reach room temperature or minimum temperature recommended by manufacturer before beginning installation.
- H. Protect adhesives from freezing. Follow manufacturer's recommendations for minimum temperatures to which adhesives are exposed.

1.8 QUALIFICATIONS

A. Manufacturer:

1. Company specializing in manufacturing Commercial Carpet with a recommended minimum five (5) years of documented experience and recommended to have been in continuous operation and using technology that has been in use for a recommended (10) years.
2. The manufacturer must agree to provide on-site supervision during the start up phase of installation without any additional cost to the Owner.
 - a. The manufacturer shall provide the Architect with written documentation of locations within the project that were supervised by the manufacturer.
 - b. Manufacturer shall notify the Architect and the General Construction Work Contractor if installation instructions are not completely followed.

B. Installer:

1. Company specializing in installing CEM with a recommended minimum five (5) years of documented experience approved by the manufacturer, and participation in manufacturer's installation programs including responsible carpet removal.
 - a. The installation of the CEM must be guaranteed by the manufacturer of the carpet.
 - b. Installation must be performed by an installer that is pre-approved in writing by the manufacturer of the carpet.
 - c. The agreement between the manufacturer and the installer must specifically address all installation procedures and materials to be used with the specified warranties.
2. Installer shall follow all installation procedures recommended by the manufacturer and use only materials supplied by the manufacturer to assure obtaining required warranties offered by the manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original factory original wrappings, clearly labeled with identification of manufacturer, brand name, quality or grade, fire hazard classification, and lot number.
- B. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity; laid flat, blocked off ground to prevent sagging and warping.
- C. Comply with instructions and recommendations of manufacturer for special delivery, storage, and handling requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Basis of Design: "Anthracite - #603059", as manufactured by Interface Flor; or approved equal.
 - 1. Made for the most demanding applications, Anthracite is durable, anti-slip flooring with outstanding sound absorption properties. Used as a walk-off mat for entryways, lobbies, concourses, and foyers, and other demanding indoor and outdoor applications.
 - 2. Product number: 6003002504
 - 3. Product Construction: Hair Tile (Needlepunch)
 - 4. Yarn System: 55% Nylon; 27.5% Animal Hair; 17.5% Polyester
 - 5. Dye Lots: Non-Mergeable
 - 6. Pile Height: 0.16 inch / 4.2 mm
 - 7. Pile Thickness: 0.165 inch / 4.2 mm
 - 8. Pile Density: 8,945 oz/yd³
 - 9. Size: 19.69 inches x 19.69 inches / 50 cm x 50 cm
 - 10. Total Recycled Content: 39%
 - a. Recycled Content (Post Industrial) 39%
 - b. Recycled Content (Post Consumer) 0%

2.2 ACCESSORIES

- A. Floor Primer: Manufacturer's approved floor primer applied to all areas that will receive CEM.
- B. Installation Adhesive: Low VOC Manufacturer's adhesives. No other adhesive materials will be accepted.
- C. Miscellaneous Materials: As recommended by manufacturer of CEM for other products; selected by Installer to meet project circumstances and requirements.
- D. Accessories: Architect shall specify manufacturers' color coordinated rubber accessories as required, including (but not limited to) resilient wall base, reducers or other edgings, etc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine and test substrates for moisture content, high alkalinity, levelness and other conditions under which CEM is to be installed. Notify Contractor in writing of major conditions detrimental to proper completion of the work.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.
 - a. Commencement of work shall constitute acceptance of conditions. Any necessary remedial work required to correct any unsatisfactory conditions, found after the start of installation, will be provided at no cost to the Owner.
 - 2. Coordinate with installation of floor leveling underlayment, where indicated or required.

3.2 PREPARATION

- A. Substrate: Prepare substrate to be free of paint, old adhesive, sealers, coatings, finishes, dirt, film-forming curing compounds, and all other substances which may affect the adhesion of floor covering to the substrate.
 - 1. Concrete Substrate: Reference Standard ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - a. Concrete Moisture Test: Per ASTM F 710 Section 5, persons or testing agencies with experience in concrete moisture testing shall perform moisture tests on concrete regardless of its age or grade level or history of use, with a minimum of three tests for the first 1000 square feet and one additional test for each 1000 square feet or fraction thereof, per grade level. A diagram of the area showing the location and results of each test shall be dated and submitted to the architect, general contractor and/or end user. If the test results exceed the floor covering manufacturer's limits, installing shall not commence until results conform to limits.
 - b. Concrete pH Test: Perform pH tests on concrete regardless of its age or grade level or history of use. Readings below 7.0 and above 10.0 can adversely affect resilient flooring or adhesives, or both. If the test results exceed the floor covering manufacturer's limits, installing shall not commence until results conform to limits.
- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes and other defects with sub-floor filler.
- C. Fill, level and make smooth cracks 1/16 inch or more, holes, unevenness, and roughness with compatible latex floor patching compounds. Feather floor filling or leveling compound a minimum of four (4) ft. Sweep floor of loose granular debris prior to filling. After filling, allow filler to dry. Damp mop floor with warm water and allow to dry.

Vacuum after mopping to ensure that loose granular debris is removed and to provide a proper substrate. Prohibit traffic until filler is cured.

- D. Vacuum floor again immediately before installation of CEM.
- E. Preheat areas to receive CEM to a minimum temperature of 68°F for 72 hours prior to installation, with a relative humidity of not more than 65%. Maintain minimum temperature of 50°F thereafter. CEM and adhesive must be stored at a minimum temperature of 68°F, for 72 hours prior to installation.

3.3 INSTALLATION

- A. Install CEM in accordance with the Technical Bulletins provided by the manufacturer.
- B. Perform cutting in accordance with manufacturer's recommendation using tools designed for carpet being installed. Verify carpet match before cutting to insure minimal variation between dye lots.
- C. Install CEM from same dye lot and run within each continuous area.
- D. Seal seams with manufacturer recommended seam sealer, if applicable.
- E. Use leveling compound where necessary. Feather floor leveling compounds minimum of 4 ft.
- F. Do not bridge building expansion joints with CEM. Provide for movement.
- G. Roll with appropriate roller for complete contact of adhesive to carpet backing.
- H. Complete installation of edge strips, concealing exposed edges.
- I. Use a fixed reducer strip to secure CEM in open perimeter designs.

3.4 CLEANING

- A. Remove and dispose of debris and unusable scraps. Vacuum CEM using commercial machine with face-beater element. Remove spots and replace CEM where spots cannot be removed.

3.5 CALL BACK

- A. Prior to expiration of warranty, perform all necessary corrections and adjustments.

3.6 ADDITIONAL MATERIAL

- A. Deliver to Owner as directed not less than five percent (5%) additional CEM of type, pattern and color used.

END OF SECTION 09682

SECTION 09900 - PAINTING

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.
- B. Related Section(s):
 - 1. Section 04200 - Unit Masonry.
 - 2. Section 05120 - Structural Steel.
 - 3. Section 05210 - Steel Joists.
 - 4. Section 05300 - Metal Decking.
 - 5. Section 05400 - Miscellaneous Structural Steel.
 - 6. Section 05500 - Metal Fabrications
 - 7. Section 08110 - Hollow Metalwork.
 - 8. Section 08211 - Wood Doors for light frames.
 - 9. Section 09250 - Gypsum Drywall.
 - 10. Division 15 - Mechanical Work.
 - 11. Division 16 - Electrical Work.

1.2 DESCRIPTION OF WORK

- A. Extent of painting work is indicated on drawings and schedules, and as herein specified.
- B. Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.
 - 1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.
- C. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- D. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.
- E. Following categories of work are not included as part of field-applied finish work.
 - 1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, steel windows, miscellaneous metal, hollow metal work, and similar items. Also, for fabricated components such as architectural woodwork, wood casework, and shop fabricated or factory built mechanical and electrical equipment or accessories. This is in addition to the prime coat specified herein.

2. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer-finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, architectural woodwork and casework, and shop fabricated or factory built mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
 3. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
 4. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.
 5. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.
 6. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment, identification, performance rating, name, or nomenclature plates.
- F. Mechanical and Electrical Work: Painting of mechanical and electrical work is specified herein.
1. Painting of mechanical and electrical work is limited to those items exposed to view.
 2. Mechanical items to be painted include, but are not limited to, the following:
 - a. Piping, pipe hangers and supports.
 - b. Ductwork, insulation.
 - c. Access doors and service panels.
 3. Electrical items to be painted include, but are not limited to, the following:
 - a. Conduit and fittings.
 - b. Backboxes.
 - c. Junction boxes.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- B. Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

- C. Industry Standards: Comply with industry standard established by the Painting and Decorating Contractors of America PDCA for applications, methods and recommendations and use of tools and equipment for paint and stain coatings, primers and block fillers.
- D. Lead and Chromate Contents:
 - 1. All paint products must be free of any lead or chromate contents.
- E. Volatile Organic Compound Compliant (VOC.):
 - 1. All paint products must meet the State VOC environmental regulations (OTC Regulation compliant) and the following:
 - a. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions:
 - (1) Primer, Sealer and Undercoater: VOC content of not more than 200 g/L.
 - (2) Specialty Primer, Sealer and Undercoater: VOC content of not more than 350 g/L.
 - (3) Rust Preventative Coating: VOC content of not more than 400 g/L.
 - (4) Flat Paints and Coatings: VOC content of not more than 100 g/L.
 - (5) Non-Flat Paints and Coatings: VOC content of not more than 150 g/L.
 - (6) Nonflat High Gloss Coatings: VOC content of not more than 250 g/L.
 - (7) Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
- F. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.
 - 1. At galvanized surfaces, primer shall be a zinc dust-zinc oxide coating.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Samples: Prior to beginning work, Contractor shall furnish color chips (2 fan decks) for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.
 - 1. On 12" x 12" hardboard, provide two samples of each color and material, with texture to simulate actual conditions. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved.

2. On actual wood surfaces, provide two 4" x 8" samples of natural and stained wood finish. Label and identify each as to location and application.
 3. On concrete masonry, provide complete walls or portions of walls as sample mock-ups and in sizes and locations as directed by the Architect;
 - a. Mock-up wall samples shall be for painting on masonry for each type of finish and color, defining filler, prime and finish coat.
 - b. Mock-up wall samples shall remain until authorized by the Architect for use as part of the work.
- C. Acknowledgment of Contract Documents: Contractor / Installer shall submit to the Architect certifications signed by each of the Contractor and Installer attesting acknowledgment of requirements of the Contract Documents for specific project requirements indicated in this specifications.
1. Installer shall submit proof of evidence, (this project specification section) with his letter of certificate.
 2. Contractor / Installer shall not proceed with painting work of this section until submittal of required certifications are completed.
 3. Any work performed prior to completion of this submittal shall be subject to total rejection by the Architect. All rejected work shall be rectified without any additional cost to the Owner.
- E. Coating Maintenance Manual: Upon conclusion of the project, the contractor in conjunction with the coating manufacturer shall furnish a coating maintenance manual such as the Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an area summary with finish schedule, area detail designating where each product/color/finish was used, product data pages, SDS pages, care and cleaning instructions, touch up procedures and color samples of each color and finish used.

1.5 DELIVERY AND STORAGE

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
- Name or title of material.
 - Fed. Spec. number, if applicable.
 - Manufacturer's stock number and date of manufacturer.
 - Manufacturer's name.
 - Contents by volume, for major pigment and vehicle constituents.
 - Thinning instructions.
 - Application instructions.
 - Color name and number.

1.6 JOB CONDITIONS

- A. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45°F (7°C) and 95°F (35°C), unless otherwise permitted by paint manufacturer's printed instructions.

- B. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
- C. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.
- D. Provide sufficient temporary illumination producing overall space/room minimum illumination level of 50 ft. candles while preparing or painting of surfaces and to assure the production of quality finishes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include but are not limited to the following:
 - 1. M A B
 - 2. Benjamin Moore
 - 3. PPG Architectural Coatings
 - 4. The Sherwin-Williams Company
 - 5. Or approved equal.

2.2 COLORS AND FINISHES

- A. Prior to beginning work, Contractor shall furnish color chips for surfaces to be painted from manufacturers full line of products. This shall include custom colors.
 - 1. Contractor shall allow for a total of 20 different colors of each type of paint, (excluding graphics and /or art work as indicated) with change of color within a room or space occurring either on a horizontal or vertical line, [allow for multiple (4) colors at each room unless otherwise shown]. Where roof structure is exposed, steel beams, steel joists and metal decking will be painted with different colors, as selected by the Architect.
 - 2. Contractor shall allow for split frames at all new and existing hollow metal door frames to be painted.
 - 3. Final acceptance of colors will be from samples supplied on the job.
- B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

2.3 MATERIALS

- A. Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

- B. Provide undercoat paint recommended and produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

2.4 EXTERIOR PAINT SCHEDULE

- A. Basis of Design: Provide the following paint systems for the various substrates. Other equal paint products by indicated manufacturers will be acceptable:
- B. High-Gloss Enamel (Water-base Polyester Urethane Finish)
 - 1. 1st Coat: Sherwin-Williams, Pro Industrial Pro-Cryl Universal Primer, B66W310.
 - 2. 2nd Coat: Sherwin-Williams, Hydrogloss 1K Water-based Urethane, B65-180.
 - 3. 3rd Coat: Sherwin-Williams, Hydrogloss 1K Water-based Urethane, B65-180.
 - 4. Apply to the following exterior surfaces: Lintels, ferrous metal and other exterior assemblies to receive paint.
 - 5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.
- C. Semi-Gloss Enamel (Waterbased Alkyd Urethane Enamel Finish)
 - 1. 1st Coat: Sherwin-Williams, Extreme Bond Exterior Primer, B51W00150.
 - 2. 2nd Coat: Sherwin-Williams, Pro Industrial Waterbased Alkyd Urethane, B53-1150.
 - 3. 3rd Coat: Sherwin-Williams, Pro Industrial Waterbased Alkyd Urethane, B53-1150.
 - 4. Apply to the following exterior surfaces: Lintels, ferrous metal, and other exterior assemblies to receive paint.
 - 5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

2.5 INTERIOR PAINT SCHEDULE

- A. Semi-Gloss (Satin) Enamel:
 - 1. 1st Coat: Sherwin-Williams, Pro Industrial Pro-Cryl Universal Primer, B66W310.
 - 2. 2nd Coat: Acrylic Enamel, Sherwin-Williams, Pro Industrial HP Acrylic, B66-650.
 - 3. 3rd Coat: Acrylic Enamel, Sherwin-Williams, Pro Industrial HP Acrylic, B66-650.
 - 4. Apply to following interior surfaces: Hollow metal work, metal lites for wood doors, miscellaneous steel and ferrous metal fabrications.
 - 5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

B. Egg-Shell / Satin Enamel - Acrylic Latex:

1. Base Coats: Enamel Undercoat; Primer-Sealer to suit substrate or Loxon Block Surfacer, A24 for Concrete Masonry/CMU Block.
 - * Block Filler shall be Level 3 - Premium Fill; one or multiple coats for high performance block filler in accordance with PDCA industry standards. Apply mock-up to confirm appearance before application of finish coats.
2. 2nd Coat: Sherwin-Williams, ProMar 200 Zero VOC Eg-Shel, B20-2600 Series.
3. 3rd Coat: Sherwin-Williams, ProMar 200 Zero VOC Eg-Shel, B20-2600 Series.
4. Apply to the following interior surfaces: Concrete masonry units, gypsum drywall and other interior assemblies to receive paint.
5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

C. Flat - Acrylic Latex:

1. 1st Coat: Sherwin Williams ProMar 200 Zero VOC Interior Latex Primer, B28W02600.
2. 2nd Coat: Sherwin Williams, ProMar 200 Zero VOC Flat Interior Latex Flat, B30-2600.
3. 3rd Coat: Sherwin Williams, ProMar 200 Zero VOC Flat Interior Latex Flat, B30-2600.
4. Apply to following interior surfaces: Interior surfaces of ducts, where visible through registers or grilles, etc.
5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

2.6 EXTRA STOCK

- A. Contractor shall provide one gallon of extra stock for each color/type selected for use on the project. Provide unopened containers clearly marked with manufacturers color number and name.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions, included rotted or otherwise defective materials, have been observed by all concerned and corrected in a manner acceptable to Applicator.

- B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION

A. General:

1. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
2. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
3. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
4. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.
5. Painting of materials shall commence only when the moisture content of the materials complies with manufacturer's recommendations as follows:
 - a. Concrete and masonry - 22% maximum.
 - b. Gypsum drywall - 12% maximum.

B. Cementitious Materials:

1. Prepare cementitious surfaces of concrete, concrete block, cement plaster and gypsum drywall board to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.
2. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

C. Ferrous Metals:

1. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

2. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with same type shop primer.
3. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.

3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
- D. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.4 APPLICATION

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Where finish schedule calls for walls, floors or ceilings to be painted, paint all new and existing surfaces in same area. Paint from corner to corner on walls, floors, or ceilings, or to a major change in direction of surface to be painted. Provide crisp, clean, sharp lines where new painted surfaces abut existing painted surfaces.
- C. **Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.**
- D. **Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.**
- E. Sand lightly between each succeeding enamel coat.
- F. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- G. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

- H. **Minimum Coating Thickness:** Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as recommended by coating manufacturer and an acceptable finished appearance in finish, color and appearance as determined by the Architect.
- I. Primer Coat: Apply primer coat of material which is required to be painted or finished, and which has not been prime coated by others.
 - 1. **Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.**
- J. **Block Fillers:** Apply block fillers using manufacturer's recommended application techniques with sufficient material and coats to achieve a pinhole-free, "Level 3 - Premium Fill Surface", and in accordance with PDCA 's industry standards.
- K. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- L. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.5 CLEAN-UP AND PROTECTION

- A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.
- B. Upon completion of painting work, clean all paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
 - 1. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
 - 2. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 09900

SECTION 10440 - SPECIALTY SIGNS

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 DESCRIPTION OF WORK

- A. Extent of specialty signs is shown on the drawings.
- B. Forms of specialty signs required include the following:
 - 1. Panel signs (Room Identification Signs).
 - 2. Metal Letters.
 - 3. Exterior signs.
 - 4. Installation of all specialty signs.

1.3 QUALITY ASSURANCE

- A. Uniformity of Manufacturer: For each sign form and graphic image process indicated furnish products of a single manufacturer.
- B. All signs shall conform to the International Building Code and ICC/ANSI A117.1. - 2009 requirements for accessible building elements.
 - 1. All signs to permanent rooms and spaces shall include Braille in accordance with N.J.A.C. 5:23-7.11 (j).

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required.
- B. Samples: Submit samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacturer and design of each sign component including graphics.
 - 1. Submit full-size sample units, if requested by the Architect. Acceptable units may be installed as part of the work.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of specialty signs. Include plans, elevations, and large scale details of sign wording and lettering layout. Show anchorages and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.
 - 1. Furnish full-size spacing templates for individual building-mounted letters.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
1. Americraft Inc.
 2. Architectural Graphics Inc.
 3. ASI Sign Systems, Inc.
 4. Bayuk Graphic Systems, Inc.
 5. Brandon Signage Co.
 6. Designer Sign Company.
 7. Gemini
 8. Mohawk Sign Systems.
 9. Or approved equal.

2.2 MATERIALS

- A. GENERAL: Provide manufacturer's standard plastic signage which comply with the requirements established in the International Building Code and ICC/ANSI 117.1 - 2009 Barrier Free Standards. All signs to permanent rooms and spaces shall include Braille in accordance with N.J.A.C. 5:23-7.11 (j).
1. Acrylic sheet material to be cut to the desired sizes with radius or square corners as indicated, or as per approved shop drawings.
 2. Manufacturer's standard extruded aluminum and acrylic material, as indicated, for Barrier Free Accessible signage indicating International Symbol of Accessibility.
 3. "Helvetica Regular" letter style, Domed Grade II Braille and other pictograms as described herein.
 4. Colors: As selected by the Architect from manufacturer's standards after award of contract, or as specified herein.
- B. Aluminum Extrusions: Provide aluminum extrusions of alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.
- C. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by the aluminum producer and finisher for the casting process used and for the use and finish indicated.
- D. Fasteners: Unless otherwise indicated, used concealed fasteners fabricated from metals that are non-corrosive to either the sign material or the mounting surface.
- E. Anchors and Inserts: Use non-ferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.3 FABRICATION

- A. Unframed Panel Signs: Fabricate unframed panel signs with edges mechanically and smoothly finished to conform with the following requirements:
 - 1. Edge Condition: Square cut.
 - 2. Corner Condition: Provide radius corners for each sign type.

2.4 SIGNAGE

- A. GENERAL: ALL signage MUST comply with the requirements established in the International Building Code and ICC/ANSI 117.1 - 2009. All signs to permanent rooms and spaces shall include Braille in accordance with N.J.A.C. 5:23-7.11 (j).

B. INTERIOR SIGNAGE:

1. Room Names and Numbers Signage:

- a. Provide Room Name and Numbers plastic signs for all rooms with name and room number, as shown on drawings and schedules.
 - 1) Type "8" Signs - Multi-Purpose Room, Stage, Cafeteria, Faculty Dining, Main Offices, Media Center, Kitchen, etc. :
 - a) Provide sand-carved process, 1/8" thick non-combustible, self-extinguishing solid composite plastic with integral tactile letters, numbers and symbols raised a minimum of 1/32" from sign face.
 - 2) Sizes: As indicated or as directed by the Architect / Owner.
 - 3) All room signs shall have radius corners.

2. Barrier Free Accessibility Signs and Directional Signage:

- a. Basis of Design; "Vandal-resistant signs" as manufactured by Americraft Inc. Tel.# 800.237.3984.
 - 1) Provide injection molded process, 1/8" thick acrylic with non-glare clear front surface, graphics and colors on second surface (Back surface), with radius corners and stepped edging. Provide mounting holes with stainless steel screws. Colors to be selected by the Architect from manufacturer's available full range of colors.
 - 2) Provide tactile plastic signs displaying international symbol of accessibility in tactile form and accompanied by Grade II Braille.
 - 3) For Directional Signage, indicate the route to the nearest accessible element.
 - 4) Provide signage at the following locations and as indicated on the Contract Drawings:
 - a) Accessible toilet units including stalls.
 - b) Accessible building entrances.
 - c) Accessible means of egress.

3. Signage Locations:

- a. Along the door on the latch side and shall be mounted as follows:

- 1) 48" minimum to the lowest tactile character on the sign measured from the finish floor.
 - 2) 60" maximum to baseline of highest tactile character on the sign measured from the finish floor.
- b. For locations having double doors, mounting shall be to the right of the right hand door.
- c. Where there is no wall space on the latch side of the door, including double leaf doors, signs shall be placed on the nearest adjacent wall.
4. Graphic Content and Style: Provide sign copy to comply with the requirements indicated for sizes, styles, spacing, content, positions, materials, finishes and colors of letters, numbers, symbols and other graphic devices.
 - a. Raised Copy Thickness: Not less than 1/32" from the sign face.
 - b. Raised characters shall be in different color and meets the Barrier Free requirements for a 70% contrast ratio of colors. Colors shall be selected from manufacturer's available full range of colors.
 - c. Raised characters and symbols for tactile signs shall be 5/8" high minimum and 2" high maximum. Sign size shall suit the required letters and numbers.
5. Braille Copy: Braille Copy shall be Grade II and shall conform to Specification 800, National Library Service, Library of Congress. Braille shall be raised integral .0625 diameter.
 - a. Braille shall be separated 1/2" minimum from the corresponding raised characters or symbols.
6. Mounting: As directed by the Architect using required fasteners.

C. EXTERIOR SIGNS:

1. Directional signs to accessible entrances to be located as shown on drawings or as indicated herein.
 - a. Provide silk screened copy, on baked enamel aluminum, colors as indicated or as otherwise required by authorities having jurisdiction, (Manual on Uniform Traffic Control Devices latest edition) with aluminum post embedded in concrete.
 - b. Accessible Entrance Sign: Provide aluminum entrance signs at each indicated entrance, displaying international symbol of accessibility. Provide silk screened copy, blue on white baked enamel.
2. Fasteners and Anchors: Use manufacturer's recommended type, size and quantity of fasteners for indicated signs. Provide concealed mounting and predrilled holes for setting wall anchors.
3. Mounting Posts: 2-7/8" diameter, aluminum pipe, finish and color to be selected by the Architect from manufacturer's standard.

- a. Provide aluminum interlocking brackets and bolt/nut sets.

2.5 METAL LETTERS

- A. Provide metal letters to comply with the requirements of indicated Codes for the manufacturing process, materials, finish, style, size and message content and mounting heights.
- B. Form letters by casting. Produce characters with smooth, flat faces, sharp corners, precisely-formed lines and profiles, free from pits, scale, sand holes or other defects. Cast lugs into the back of the characters and tap to receive threaded mounting studs.
 1. Metal: Aluminum.
 2. Provide block letters, Helvetica, medium style, unless otherwise indicated.
 3. Size: Height (as shown).

2.6 FINISHES

- A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's available full range of colors.
- B. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
 1. Aluminum Finishes:
 - a. Class II Clear Anodized Medium Satin Finish: Provide AA-M31C22A31 finish (medium satin mechanical finish, with chemical etch, medium matte finish, 0.4 mil thick minimum anodic coating).
 - b. Baked Enamel Finish: Provide finish AA-M4xC12C42R1x (manufacturer's standard non-directional mechanical finish including sanding and filing, cleaning with inhibited chemicals, conversion coated with an acid-chromate-fluoride-phosphate treatment and painted with organic coating specified below).
 - 1) Organic Coating: Provide manufacturer's standard thermosetting enamel system consisting of a prime coat and a finish coat.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Locate sign units and accessories where shown or scheduled, using mounting methods of the type described and in compliance with the applicable Codes and regulation.
- B. Install sign units level, plumb and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- C. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:

1. Silicone Adhesive Mounting: Use liquid silicone adhesive recommended by the sign manufacturer to attach sign units to irregular, porous or vinyl-covered surfaces.
 - a. Use double-sided vinyl tape where recommended by the sign manufacturer to hold the sign in place until the adhesive has fully cured.
 - b. Fasteners and Anchors: Manufacturer recommended concealed types for indicated signage and substrate materials.

3.2 CLEANING AND PROTECTION

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 10440

SECTION 10900 - MISCELLANEOUS EQUIPMENT AND FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Part 1 through Part 6 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of type of equipment is shown on the drawings.
 - 1. Architectural Bird Control

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations, including data which substantiates that materials comply with requirements.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of referenced work. Include plans, elevations and details of sections and connections. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL BIRD CONTROL

- A. Basis of Design: Provide Stainless Steel Bird Control "Model S Nixalite"; Nixalite of America, East Moline, IL, Tel.# 800.624.1189, birdcontrol@nixalite.com; or approved equal.
 - 1. Provide single and double exposed applications as recommended by manufacturer for indicated applications.
 - 2. Spacing between rows; maximum 5", minimum 3-1/2", and as per manufacturer's recommendation.
 - 3. Spacing between the outside edge of installation surface and base strip of first row; maximum 1-3/4", as per manufacturer's recommendation.
 - 4. Extend base strip a minimum of 1/2" over ends of surface.
 - 5. Spacing between base strip and inside wall surface; maximum of 2-1/4".
 - 6. Needles must extend a minimum of 1/4" over outside edge of the installation surface.
 - 7. Finish and Color: Provide manufacturer's standard coating in color as selected by the Architect from manufacturer's available full range of colors.

PART 3 - EXECUTION

3.1 INSTALLATION

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

END OF SECTION 10900

PART 3 - MISCELLANEOUS & STRUCTURAL STEEL WORK

SECTION 05120 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections and type of steel required.
- B. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" as modified here and as otherwise shown on drawings.
- C. Miscellaneous Metal Fabricators are specified elsewhere in Division 5.
- D. Refer to Division 3 for anchor bolt installation in concrete; Division 4 for masonry.
- E. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
 - 1. Promptly remove and replace materials or fabricated components which do not comply.
- F. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.
 - 1. Promptly notify Architect whenever design of members and connections for any portion of structure are not clearly indicated.

1.2 SUBMITTALS

- A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
 - 2. High-strength bolts (each type), including nuts and washers.
 - 3. Structural steel primer paint.
- B. Shop Drawings: Submit shop drawings, including complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams.

- C. Include details of cuts, connections, camber, holes and other pertinent data. Indicate welds by standard AWS A2.1 and A2.4 symbols; and show size, length and type of each weld.
 - 1. Provide setting drawings, templates and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.
- D. Test Reports: Submit copies of tests conducted on shop and field bolted and welded connections. Include data on type (s) of tests conducted and test results.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
- B. AISC "Code of Standard Practice for Steel Buildings and Bridges".
 - 1. Paragraph 4.2.1 of the above code is hereby modified by deletion of the following sentence: "This approval constitutes the owner's acceptance of all responsibility for the design adequacy of any connections designed by the fabricator as a part of this preparation of these shop drawings".
- C. AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", including "Commentary" and Supplements thereto as issued.
- D. AISC "Specifications for Architecturally Exposed Structural Steel".
- E. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
- F. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel".
- G. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".
- H. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
 - 1. If recertification of welders is required, retesting will be Contractor's responsibility.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.
- B. Structural Steel Wide Flange Shapes: ASTM A 992/A572, Grade 50
- C. Other Structural Steel Shapes, Plates and Bars: ASTM A 36.
- D. Cold-Formed Steel Tubing: ASTM A 500, Grade B.
- E. Anchor Bolts: ASTM F 1554, Grade 36, nonheaded type unless otherwise indicated.
- F. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts and hardened washers, as follows:
 - 1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A 325.
 - 2. Direct tension indicator washers may be used at Contractor's option.
- G. Electrodes for Welding: Comply with AWS Code.
- H. Structural Steel Primer Paint: SSPC-PS Guide 7.00

2.2 FABRICATION

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
- B. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
- C. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs and other defects.
- D. Connections: Weld or bolt shop connections, as indicated.
- E. Bolt field connections, except where welded connections or other connections are indicated.

1. Provide high-strength threaded fasteners for all bolted connections, except where unfinished bolts are indicated.
- F. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" (RCRBSJ).
- G. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds and methods used in correcting welding work.
- H. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.
- I. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.
- J. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- K. Field drill holes in existing steel members for connection of new steel as noted on the drawings.

2.3 SHOP PAINTING

- A. General: Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar or to receive fire-proofing. Paint embedded steel which is partially exposed on exposed portions and initial 2" of embedded areas only.
- B. Surface Preparation: After inspection and before shipping, clean steelwork to be painted. Remove loose rust, loose mill scale and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows:
 1. SP-1 "Solvent Cleaning".
 2. SP-3 "Power Tool Cleaning".
- C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with Manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces.

PART 3 - EXECUTION

3.1 ERECTION

- A. Surveys: Employ a registered professional engineer or land surveyor for accurate erection of structural steel. Check elevations of concrete and masonry bearing

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surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustment to structural steel work have been agreed upon with Architect.

- B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.
- C. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.
- D. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- E. Level and plumb individual members of structure within specified AISC tolerances.
- F. Splice members only where indicated and accepted on shop drawings.
- G. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.
- H. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment and removal of paint on surfaces adjacent to field welds.
- I. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
- J. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only as acceptable to Architect.
- K. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
- L. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.

3. 2 QUALITY CONTROL

- A. The Contractor shall engage an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.

- B. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
- C. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
- D. Testing agency may inspect structural steel at plant before shipment; however, Architect reserves right, at any time before final acceptance, to reject material not complying with specified requirements.
- E. Correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any noncompliance of original work, and as may be necessary to show compliance of corrected work.
- F. Shop Bolted Connections: Inspect or test in accordance with AISC specifications.
- G. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Perform visual inspection of all welds.
- H. Field Bolted Connections: Inspect in accordance with AISC specifications.
- I. Field Welding: Inspect and test during erection of structural steel as follows:
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Perform visual inspection of all welds.
- J. Testing agency shall confirm that the structure is square, plumb and level in accordance with AISC tolerances.

END OF SECTION 05120

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SECTION 05210 - STEEL JOISTS

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 SCOPE

- A. The extent of steel joists is shown on the drawings, including basic layout and type of joists required.

1.3 QUALITY ASSURANCE

- A. Provide joists fabricated in compliance with the following, and as herein specified.
 - 1. AISC-SJI "Standard Specifications, Load Tables and Weigh Tables for Steel Joists and Joist Girders" for:
 - a. K-Series Open Web Steel Joists.
 - b. LH and DLH Series Longspan and Deep Longspan Steel Joists.
- B. Steel joist manufacturer shall be an approved member of the Steel Joist Institute for the types of joists supplied.
- C. Qualification of Welding Work:
 - 1. Qualify welding processes and welding operators in accordance with the AWS "Standard Qualification Procedure".
 - 2. Joists welded in place are subject to inspection and testing. Expense of removing and replacing any portion of the steel joists for testing purposes will be borne by the Owner if welds are found to be satisfactory. Remove and replace any work found to be defective and provide new acceptable work.
- D. Workmanship:
 - 1. Steel Inspection and Testing Service: Owner shall employ a testing laboratory acceptable to the Architect to inspect welded connections and to perform tests and submit inspection and test reports to the Architect.

1.4 SUBMITTALS

- A. Manufacturer's Data, Steel Joists:
 - 1. Submit two (2) copies of manufacturer's specifications and installation instructions for each type of joist and its accessories. Include manufacturer's certification that joists comply with AISC-SJI "Specifications".

- B. Shop Drawings, Steel Joists:
 - 1. Submit detailed drawings showing layout of joist units, special connections, jointing and accessories. Include the mark, number, type, location and spacing of joists and bridging. Provide templates or location drawings for installation of anchor bolts.
- C. Delivery, Storage and Handling:
 - 1. Deliver, store and handle steel joists as recommended in AISC-SJI "Specifications". Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel: Comply with AISC-SJI "Specifications".
- B. Steel Prime Paint: Comply with SJI "Specifications".

2.2 FABRICATION

- A. General: Fabricate steel joists in accordance with AISC-SJI "Specifications".
- B. Extended Ends: Provide extended ends on joists where shown, complying with the manufacturer's standards and requirements of applicable AISC-SJI "Specifications" and load tables.
- C. Bridging: Provide horizontal or diagonal type bridging for "open web" joists, complying with AISC-SJI "Specifications". Provide bridging anchors for ends of all bridging lines terminating at walls or beams, except at fire walls.
- D. End Anchorage: Provide end anchorages to secure joists to adjacent construction, complying with AISC-SJI "Specifications", unless otherwise indicated.
- E. Header Units: Provide header units to support tail joists at openings not framed with steel shapes.
- F. Shop Painting: Shop paint all steel joist work, except contact surfaces which are to be welded or high-strength bolted.
- G. Surface Preparation: After inspection and before shipping, clean steelwork to be painted complying with SJI "Specifications" unless otherwise indicated.
- H. Application: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide a uniform dry film thickness of 2.0 mils. Use painting methods which will result in full coverage of joints, corners, edges and all exposed surfaces.

PART 3 - EXECUTION

3.1 ERECTION

- A. Place and secure steel joists in accordance with AISC-SJI "Specifications", final shop drawings and as herein specified.
- B. Placing Joists:
 - 1. Do not start placement of steel joists until supporting work is in place and secured. Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening.
 - 2. Provide temporary bridging, connections and anchors to ensure lateral stability during construction. Where "open web" joist lengths are 40 feet and longer, install a center row of bolted bridging to provide lateral stability before slackening of hoisting lines.
- C. Bridging: Install bridging simultaneously with joist erection, before any construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams, except at fire walls.
- D. Fastening Joists: Field weld or high-strength bolt joists to supporting steel framework in accordance with AISC-SJI "Specifications" and as shown on drawings for the type of joists used. Coordinate welding sequence and procedure with the placing of joists.
- E. Touch-Up Painting: After joist installation, paint all field bolt heads and nuts, and welded areas, abraded or rusty surfaces on joists and steel supporting members. Wire brush surfaces and clean with solvent before painting. Use the same type of paint as used for shop painting.

3.2 FIELD QUALITY CONTROLS

- A. The Contractor will employ a testing laboratory satisfactory to the Architect to perform the tests and to submit testing and inspection reports. The testing agency shall conduct and interpret the tests and state in each report whether the test specimens comply with the requirements, and specifically state any deviations therefrom.
 - 1. Provide access for the testing agency to places where steel joist work is being fabricated or produced so that required inspection and testing can be accomplished.
 - 2. The testing agency may inspect steel joist work at the plant before shipment; however, the Architect reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.
- B. Inspection of Shop Painting:
 - 1. Visually evaluate surface preparation by comparison with pictorial standards in accordance with SSPC-Vis 1.

2. Measure dry film thickness with a magnetic film thickness gage in accordance with SSPC-PA 2.
 3. Visually inspect dried film for runs, sags, dry spray, over-spray and missed areas.
- C. Correct deficiencies in steel joist work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of the original work, and as may be necessary to show compliance of corrected work.

END OF SECTION 05210

SECTION 05300 - STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of metal decking is indicated on drawings, including basic layout and type of deck units required.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.
- B. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details and conditions requiring closure panels, supplementary framing, cant strips, cut openings, special jointing or other accessories.

1.3 QUALITY ASSURANCE

- A. Code and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated or specified:
 - 1. AISI "Specification for the Design of Cold-Formed Steel Structural Members".
 - 2. AWS D1.3 "Structural Welding Code - Sheet Steel".
 - 3. SDI "Design Manual for Floor Decks and Roof Decks"
- B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1.
- C. Welded decking in place is subject to inspection and testing. Expense of removing and replacing portions of decking for testing purposes will be borne by Owner if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products of the following:
 - 1. Metal Roof Deck Units: Epic Metal Corp.
 - 2. Or approved equal.

2.2 MATERIALS

- A. Steel for Galvanized Metal Deck Units: ASTM A 653, Grade 33.

- B. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.
- C. Galvanizing: ASTM A 653, G60.
- D. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).
- E. Flexible Closure Strips: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.

2.3 FABRICATION

- A. General: Form deck units in lengths to be continuous over three (3) or more spans, with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated.
- B. Roof Deck Units: Provide deck configurations complying with SDI "Roof Deck Specifications" of metal thickness, depth and width as shown.
- C. Metal Closure Strips: Fabricate metal closure strips, for cell raceways and openings between decking and other construction, of not less than 0.045" min. (18 gage) sheet steel. Form to provide tight-fitting closures at open ends of cells or flutes and sides of decking.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.
- B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.
- C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
- D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.
- E. Do not place deck units on concrete supporting structure until concrete has cured and is dry.
- F. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
- G. Fastening Deck Units:
 - 1. Fasten roof deck units to steel supporting members by not less than 5/8" diameter fusion welds or elongated welds of equal strength, spaced not more than 12" o.c. In addition, secure deck to each supporting member in ribs where side laps occur.

- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds and methods used in correcting welding work.
- I. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.
- J. Mechanically fasten side laps of adjacent deck units between supports, at intervals not exceeding 36" o.c. using self-tapping No. 8 or larger machine screws, unless a closer spacing or a larger screw is called for on the drawing.
- K. Uplift Loading: Install and anchor roof deck units to resist gross uplift of 45 lbs. per sq. ft. at eave overhang and 30 lbs. per sq. ft. for other roof areas.
- L. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work shown.
- M. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units, except where taped joints are required.
- N. Edge Finish Strips: Provide metal finish strips at edges of roof decking, parallel to flutes. Weld into position to provide a complete deck installation.
- O. Touch-Up Painting: After deck installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.
 - 1. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.
 - 2. Touch-up painted surface with same type of shop paint used on adjacent surfaces.
- P. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.
- Q. Touch-Up Painting: Cleaning and touch-up painting of field welds, abraded areas and rust spots, as required after erection and before proceeding with field painting, is included in Division 9 under Painting.

3. 2 QUALITY CONTROL

- A. The contractor shall employ a testing laboratory satisfactory to the Architect to perform the following tests and to submit testing and inspection reports.
 - 1. Welding: Inspect welding to determine if welds are at proper locations, are proper size and material, and meet AWS standards.
 - 2. Sidelap Connections: Inspect sidelap connections to determine if the connections are in accordance with contract documents.

END OF SECTION 05300

SECTION 05400 - MISCELLANEOUS STRUCTURAL STEEL

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 DESCRIPTION OF WORK

- A. Definition: Miscellaneous structural steel include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of Structural Steel or other metal fabrication systems specified elsewhere.
- B. Extent of miscellaneous structural steel fabrications is indicated on drawings and schedules.
 - 1. Work of this section shall include miscellaneous structural steel framing and supports for floor, and wall openings whether or not shown on the drawings.
 - a. Refer to architectural, mechanical and electrical drawings for the following:
 - 1) Locations and sizes of wall penetrations, wall chases, louvers, duct penetrations, etc.
 - 2) Locations of all steel handrails, railings and guardrails.
 - b. All miscellaneous structural steel supports shall be in accordance with typical structural steel details and schedules shown on structural steel drawings and/or as directed by the Architect.
 - c. All miscellaneous structural steel supports shall meet indicated load requirements and/or as directed by the Architect.
 - d. In existing building(s) where alteration and/or renovation work is/are indicated, refer to Division 1 Sections for miscellaneous structural steel framing and supports which may be assigned to be provided and installed by other Trades.
- C. Types of work in this section include metal fabrications for:
 - 1. Loose Steel lintels, bearing and leveling plates and miscellaneous steel framing and supports
 - 2. Steel framing support for floor landing extension.
 - 3. Steel railings, handrails, and guardrails at stairs.
- D. Related Sections:
 - 1. Section 01400 - Testing Laboratory Service.
 - 2. Section 04200 - Unit Masonry

3. Section 05120 - Structural Steel
4. Section 05210 - Steel Joists
5. Section 05300 - Metal Decking
6. Section 05400 - Miscellaneous Structural Steel
7. Section 05500 - Metal Fabrications
8. Section 09900 - Painting

1.3 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrications might delay work.
- B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Delegated Design:
 1. 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. Designated Design includes, but is not limited to:
 - a. Miscellaneous steel framing, stair landings and supplemental framing for landings, metal framing, hangers, columns, struts, clips, brackets, bearing plates and other components.
 - b. Handrails, guardrails, balusters, newel posts, clips struts, brackets, bearing plates and other components.
 2. Professional Engineer Qualifications: A professional engineer legally authorized to practice in the jurisdiction where Project is located, (State of New Jersey), and experienced in providing engineering services of the kind indicated that have resulted in the installation of structural assemblies, similar to this Project in material, design, and extent and that has a record of successful in-service performance. Provide analysis data and signed & sealed documents.
 3. Conform to all applicable State and Local Codes for design loads and all other requirements.
 4. Refer to paragraph 1.4 - SUBMITTALS (below).
- D. Regulatory Requirements: Products and finished installations to be used by persons with disabilities must comply with requirements of the Uniform Construction Code, American National Standard, Accessible and Usable Buildings and Facilities, ICC / ANSI A117.1-2009.
- E. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

1. Architectural Class.
 - a. Fabricator Qualifications: A firm experienced in producing metal stairs 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.
- F. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel," and AWS D1.3, "Structural Welding Code-Sheet Steel."

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous steel fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
 1. Submit shop drawings for miscellaneous steel framing and supports, and railings. Signed and sealed shop drawings shall be submitted by a qualified professional Structural Engineer, licenced in the state where project is located
- C. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.
- D. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrication of miscellaneous structural steel work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Steel
 1. Steel Plates, Shapes and Bars: ASTM A 36.
 2. Steel Tubing: Cold-formed, ASTM A 500; or hot-rolled, ASTM A 501.
 3. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
 4. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

5. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.
 6. Gray Iron Castings: ASTM A 48, Class 30.
 7. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
- C. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- D. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
- E. Grout:
1. Metallic Non-Shrink Grout: Pre-mixed, factory-packaged, ferrous aggregate grout complying with CE CRD-C588, Type M.
 2. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
- F. Fasteners:
1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
 2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
 3. Lag Bolts: Square head type, FS FF-B-561.
 4. Machine Screws: Cadmium plated steel, FS FF-S-92.
 5. Wood Screws: Flat head carbon steel, FS FF-S-111.
 6. Plain Washers: Round, carbon steel, FS FF-W-92.
 7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
- G. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
1. Lock Washers: Helical spring type carbon steel, FS FF-W-84.
- H. Paint:
1. Surface Preparation: SSPC-2P6 commercial Blast Cleaning.

2. Primer: Tnemec Series 90-97 Tneme-Zinc, or equal, @ 2.5 - 3.5 mils (dry)
3. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900.

2.2 FABRICATION, GENERAL

- A. Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
- E. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- F. Galvanizing:
 1. Provide a zinc coating for exterior items and those items indicated or specified to be galvanized, as follows:
 - a. ASTM A 153 for galvanizing iron and steel hardware.
 - b. ASTM A 123 for galvanized rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
 - c. ASTM A 386 for galvanizing assembled steel products.
- G. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- H. Shop Painting
 1. Shop paint miscellaneous structural steel, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise indicated.

2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-6.
3. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
4. Apply one shop coat to fabricated metal items, except apply two coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

2.3 MISCELLANEOUS STRUCTURAL STEEL

- A. Steel Railings and Handrails: Provide handrails to comply with applicable State and Local Regulatory Requirements and in accordance with minimum requirements indicated in the Uniform Construction Code, American National Standard, Accessible and Usable Buildings and Facilities, ICC / ANSI A117.1-2009.
1. Structural Performances: Provide railing and handrail assemblies which, when installed, shall comply ASCE standards for minimum design loads for handrail assemblies and guardrail systems and capable of withstanding the following loads applied as indicated:
 - a. To resist a load of 50 pound per linear foot applied in any direction at the top and to transfer this load through the supports to the structure.
 - b. To resist a single concentrated load of 200 pounds applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to the building structural assemblies, walls, floors or slabs. This load shall act concurrently with loads indicated in Paragraph "a" above.
 - c. Intermediate rails (all those except the handrail), balusters and panel fillers shall withstand a horizontally applied normal load of 50 lbs. On an area not to exceed one square foot area including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of paragraphs "a" and "b" above.
 - d. Guards: Intermediate rails and balusters capable of withstanding a horizontal concentrated load of 200 lbs. applied on a one square foot area at any point in system of gross area of guard, including any open areas, of which they are a part. Load need not be assumed to be acting concurrently with uniform horizontal loads on top rails of railing assembly in determining stress on guard supporting members.
 - e. Guards shall be designated and constructed for a uniform load of 50 pounds per foot applied horizontally at required guardrail height and a simultaneous uniform load of 100 pounds applied vertically downwards at top of guardrail.
 - f. In-fill Area:
 - 1) Concentrated Load: 200 pounds, horizontal load, applied on a 1-square-foot area at any point in the system, including intermediate rail or other elements

serving this purpose.

- 2) This loading condition shall not be applied simultaneously with loading conditions indicated above, (a, b, and c).
- B. Fabricate pipe railings and handrails to design, dimensions, and details indicated. Provide railings and handrails members formed of pipe of sizes and wall thickness indicated, or if not shown, as required to support indicated design loading. Unless otherwise indicated all shown dimensions for pipes, rails and other round shapes are outside diameter.
1. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - a. At tee and cross intersections provide coped joints.
 - b. At bends interconnect pipe by means of prefabricated elbow fittings or flush radius bends, as applicable, of radiuses indicated.
 - c. Perform welding to comply with applicable AWS specifications, using method appropriate for metal and finish indicated. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
 2. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
 3. Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.
 4. Close exposed ends of pipe by welding 3/16" thick steel plate in place or by use of prefabricated fittings.
 5. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.
1. Coordinate work of this section with other work affected by other Trades.
 2. Obtain locations, opening sizes, weighs and other required information from affected trades.

3. Comply with coordination requirements indicated in Division 1 Sections.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.
- C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.
- E. Set loose lintels weighing more than 200 pounds, leveling and grouting as for plates. Deliver loose lintels weighing less than 200 pounds to the General Construction Contractor, allow sufficient time for scheduling his installations.

3.3 PIPE RAILINGS AND HANDRAILS

- A. Adjust railing prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated, or if not indicated, as required by design loadings. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:
 1. Anchor posts in concrete by means of sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with grout manufacturer's directions.
 2. Leave anchorage joint exposed; wipe off excess grout and leave 1/8 inch build-up, sloped away from post. For installation exposed on exterior or to flow of water, seal grout to comply with grout manufacturer's directions.
 3. Anchor rail ends into concrete and masonry with steel round flanges welded to rail ends and anchored into wall construction with lead expansion shields and bolts.
- B. Anchor rail ends to steel with steel oval or round flanges welded to rail ends and bolted to structural steel members, unless otherwise indicated.

- C. Secure handrails to wall with wall brackets and end fittings. Provide bracket with not less than 1-1/2" clearance from inside face of handrail and finished wall surface. Locate brackets as indicated, or if not indicated, at spacing required for design loading. Secure wall brackets and wall return fittings to building construction as follows:
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
 - 3. For hollow masonry anchorage, use toggle bolts having square heads.

3.4 ADJUST AND CLEAN

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting.
- B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. For galvanize surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION 05400

PART 6 - ELECTRICAL WORK

SECTION 260010 - GENERAL REQUIREMENTS ELECTRICAL

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PART 1 - GENERAL REQUIREMENTS ELECTRICAL

1.1 GENERAL

- A. The conditions of Divisions 00 and 01 apply to each and every Trade Contractor or other person or persons supplying any material or labor entering this building and/or site, either directly or indirectly. In the event of a conflict between Section 260010 and Divisions 00 and 01, the terms of Divisions 00 and 01 shall govern.
- B. One Building Trade, the Electrical Building Trade, will be covered by these General Requirements Electrical.
- C. For simplicity, this Building Trade will be referred to further herein as the Electrical Trade Contractor. The Electrical Specifications and all Electrical Drawings, together with all addenda make-up the Electrical Contract Documents, and are a part of the "Project Contract Documents", as described throughout these specifications.
- D. The term "Electrical Trade" as used in the Contract Documents, means the Electrical Building Trade.
- E. The term "indicated" means all information included, detailed, shown and/or implied on the Contract Documents.
- F. The term "existing" is used generally in reference to renovation projects. On new construction projects, the term "existing" is intended to mean work already in place.

1.2 SCOPE AND OBJECTIVES OF THE ELECTRICAL WORK

- A. The Scope and Objectives of the Electrical Work of this Project include, but are not limited to:
 - 1. Refer to Division 01 for Scope of Work and of Alternate Bids;
 - 2. Periodic inspection of completed work and site conditions by the Electrical Trade Contractor's Project Manager to confirm compliance with contract documents and verify suitability to receive subsequent work.
 - 3. Provide new light fixtures.
 - 4. Provide power to new fire shutter roll down door at Arthur Rann and Pomona;
 - 5. Provide fire alarm system relay to control the fire shutter at Arthur Rann and Pomona;
 - 6. Provide modifications to the fire alarm systems as shown on the drawings with all required equipment, labor, material, shop drawings (as required by the Authority Having Jurisdiction), programming and testing as required by NFPA 72;
 - 7. Prepare and submit as a shop drawing, minimum 1/4" to the foot scale sketches indicating compliance with code clearance, and equipment manufacturer's recommended clearance for maintenance typical for all electrical equipment, gear panels, electrical rooms and closets. Review clearance with owner's maintenance

personnel prior to submitting shop drawing for review and prior to proceeding with physical work.

1.3 INTENT OF THE ELECTRICAL CONTRACT DOCUMENTS

- A. The intent of the Electrical Contract Documents is to include all items and labor necessary for the proper execution and completion of the Work of the Electrical Trade Contractor. The Contract Documents of all Trades are complimentary to each other; what is required by one shall be as binding as if required by all. Performance of the Electrical Trade Contractor is required only to the extent consistent with the Project Contract Documents and reasonably inferable from them as being necessary to produce the desired results.
- B. It is expressly stipulated that neither the Drawings nor the Specifications shall take precedence over the other, and it is further stipulated that the Architect/Engineer may interpret or construe the Drawings and Specifications so as to secure in all cases the result most consistent with the needs and requirements of the work. In the event of such ambiguity or discrepancy, comply with the higher cost product (material plus labor), the more stringent requirement, and supply the better quality or greater quantity of work.

1.4 PROPOSAL PREPARATION

- A. Prior to submitting a pricing quotation/proposal, proceed as follows, and include the following:
 - 1. Visit the site, survey, record, confirm and include in the scope of work, all material and labor necessary to install the equipment and systems indicated. Use the Contract Documents as diagrammatic in nature, since they are not intended to show all details which may affect the electrical bid proposal.
 - 2. Include the work, as applicable, to remove and dispose of conduit, wiring, light fixtures, devices, equipment and appurtenances, not required for new work, unless otherwise indicated to be abandoned in place.
 - 3. Include all disconnections, removals and temporary provisions required to permit rigging, installation, connection, testing and operation of the new equipment. Include all such provisions whether or not shown, detailed or specified within technical sections of the Contract Documents.
 - 4. Include in the work, providing the labor of Keymen, including, but not limited to the following:
 - a. One Project Manager;
 - b. One Project Foreman.
 - 5. Foreman must refine the detail, layout, coordination and fit of all of electrical equipment. Plan all disconnections, removals, offsets, temporary provisions, as required, to fit the new equipment into the space, and as required to accommodate maintenance accessibility and service access.
 - 6. Project Manager must maintain and submit for approval, a written project schedule, on a weekly basis.

7. All Project Managers must organize, administrate, control and log the RFI process for their respective trade. Where applicable, submit all RFI(s) for master RFI log maintained by Lead/Prime Contractor.

B. In preparing a Bid Price:

1. Thoroughly review and confirm all existing conditions and Contract Document information. Make note in writing of any exceptions, misunderstandings, unclear areas, unclear directions, and any aspects which will prohibit completion of the work, in total. Failing to supply such notice, all bidders will be accountable for having accepted all conditions at the site which affect their work and their costs. By submitting a bid price, all Trade Contractors certify that the Contract Documents have been thoroughly reviewed and are sufficient for construction, and that the bidding Trade Contractors have adequate information to establish and determine their responsibility for materials, methods, costs, and schedule for their work.
2. Incorporate all requirements of all sections of the Contract Documents.
3. Include the following with the Manufacturer's and Sub-Contractor's Lists:
 - a. The name and telephone number of all Sub-Contractors.
 - b. The manufacturer and model numbers of all equipment proposed by the bidder and as listed on all of the equipment schedules and specified in the Contract Documents.

1.5 HAZARDOUS MATERIALS

- A. The use of asbestos, PCB's or any material or product containing hazardous materials in the performance of this contract is not permitted. Certify, in writing, that no hazardous material or product containing a hazardous material, has been furnished or installed.

1.6 DRAWINGS AND SPECIFICATIONS

- A. It is the intent of the specifications and drawings to include under each item all materials, apparatus and labor necessary to properly install, equip, adjust and put into perfect operation the respective portions of the installations specified and to so interconnect the various items or sections of the work as to form a complete and properly operating whole.
- B. Any apparatus, machinery, small items not mentioned in detail which are necessary to complete or perfect any portion of the installation in a substantial manner and in compliance with the requirements stated, implied or intended must be furnished and/or installed without extra cost to the Project. This includes all materials, devices or methods peculiar to the machinery, apparatus or systems furnished and/or installed by the Electrical Trade Contractor.
- C. In referring to drawings, figured dimensions take precedence over scale measurements. Verify all wall locations, ceiling heights, elevations, dimensions, etc. on the architectural drawings, where applicable. Discrepancies must be referred to the Engineer for decision.

Certify and verify all dimensions, routings and layouts in the field and on the coordination drawings before ordering material or commencing work.

- D. Any work called for in the specifications, but not mentioned or shown on the drawings, or called for on the drawings, but not mentioned in the specifications, must be furnished and/or installed as though called for in both.
- E. When any device or part of equipment is herein referred to in the singular number, such as "the pump" such reference is deemed to apply to as many such devices as required to complete the installation.
- F. The term "Provide" means "Furnish and Install". Neither term will be used generally in these specifications, but will be assumed. The term "Furnish" means to obtain and deliver to the job site for installation by other trades.

1.7 LAWS, ORDINANCES, REGULATIONS AND PERMITS

- A. The entire electrical system in all and/or in part must conform to all pertinent laws, ordinances and regulations of all bodies having jurisdiction, notwithstanding anything in these drawings or specifications to the contrary.
- B. Pay all fees and obtain and pay for all permits and inspections required by any authority having jurisdiction in connection with the work under this contract.
- C. Electrical work performed by the Electrical Trade Contractor must comply with the requirements of the National Electrical Code, NFPA and other boards and departments having local jurisdiction. Obtain and pay for an Independent Inspection by an authorized Electrical Inspection Agency (EIA) and by local, municipal and state approving agencies. Inspections performed by the local inspector do not substitute for obtaining Independent Inspection by an authorized independent Electrical Inspection Agency.
 - 1. Qualifications: The EIA is to be an independent company from the Electrical Trade Contractor, registered with the State and a Master certified member of the International Association of Electrical Inspectors.
 - 2. Prepare and submit for review and comment to the Engineer a schedule of inspections to be performed in coordination with the construction schedule.
 - 3. At a minimum, inspections shall be performed at the Rough-in, Progress and Final levels.
 - 4. The EIA shall submit written report for each level of inspection to the Engineer to document compliance with current code requirements, including deficiencies and associated required remedial action.

1.8 CONNECTIONS TO UTILITIES

- A. Apply for and obtain services from Utility Companies and municipalities. All charges for which Utility Companies and municipalities must be reimbursed must be paid for by the Electrical Trade Contractor at no additional cost to the Project.

1.9 TESTS

- A. The following requirements are supplementary to tests specified for individual equipment or systems in other specification sections. Give written notice of date of test in ample time to all concerned.
- B. Concealed or insulated work must remain uncovered until all required tests have been completed; but if construction schedule requires, arrange for partial tests on portions of systems as approved. If a Prime Contractor covers or directs a Sub-Contractor to cover electrical work prior to completing the required tests, the Prime Contractor is responsible for any additional costs related to completing the required tests.
- C. As soon as conditions permit, conduct preliminary tests of equipment to ascertain compliance with specified requirements. Make needed changes, adjustments and/or replacements as preliminary tests may indicate, prior to acceptance tests.
- D. Conduct pressure, performance and operating tests as specified or required for each system or piece of equipment installed, modified or affected under this contract in presence of the Engineer or Owner as well as a representative of agencies having jurisdiction.
- E. Obtain Certificates of Approval and/or Acceptance as specified or required in compliance with regulations of agencies having jurisdiction. Work will not be deemed complete until such Certificates have been delivered to the Engineer.
- F. Prove conclusively, by testing, that electrical systems operate properly, efficiently and quietly in accordance with intent of drawings, specifications and most widely used construction practices.

1.10 CLEANING

- A. Be responsible for the following:
 - 1. Removal of all lumber, refuse, metal, piping and debris from site resulting from electrical work.
 - 2. Cleaning drippings created by the electrical work, from finished work of other Trades.
 - 3. Cleaning, polishing, waxing of electrical work as required.
- B. After testing, and acceptance of all work by the Engineer and the Owner, thoroughly clean all electrical equipment and material to the satisfaction of the Engineer.

1.11 INSTRUCTING OWNER'S PERSONNEL

- A. After all tests and adjustments have been made, fully instruct the representatives of the Owner in all details of operation of the equipment installed under the Electrical Contract Documents.

- B. Operate electrical equipment for sufficient length of time to satisfy Engineer that requirements of Contract Documents have been fulfilled.
- C. Prepare digital recording of each Owner training session on compact disc.

1.12 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Provide in accordance with Division 01.
- B. Submit digital format PDF of Operating and Maintenance Instructions to the Engineer for review and processing.
- C. Upon completion of the Engineer's review and processing of digital format PDF of the Operating and Maintenance Instructions, submit three (3) copies of the final version of the printed instructions to the Owner. Bind instructions in separate, hardback, 3-ring loose leaf binders.
- D. Prepare instruction books by sections and include detailed Operating and Maintenance Instructions for all components of all systems, including wiring, and piping diagrams necessary for clarity. Identify the covers with the name of the project and the words "Operating and Maintenance Instructions - ELECTRICAL".
- E. Each section must have labeled tabs and be clearly marked with equipment or system name and contain detailed parts list data, ordering information therefore and the name, address and telephone number of the closest supply source.
- F. All instructional data must be neatly and completely prepared to the satisfaction of the Engineer.
- G. Provide complete copy of all warranties in separate tab with the binder.
- H. Provide copies of the as-built drawings in the manuals.
- I. Provide copy of each submittal for each piece of equipment on the project, complete with all tag numbers, Contractor's Transmittal Cover Sheet and Engineer's final Submittal Review Sheet.
- J. Provide compact disc of Owner training sessions with the manuals.
- K. Provide complete copy of the Electrical System Commissioning Report.

1.13 GUARANTEE

- A. All material, equipment and workmanship must be in first class operating condition in every respect at time of acceptance by Owner. Acceptance by the Owner will be by letter written to the Electrical Trade Contractor.
- B. Unconditionally guarantee in writing all materials, equipment and workmanship for a period of one (1) year from date of acceptance by Owner. During the guarantee period,

repair or replace, at the Electrical Trade Contractor's expense, any materials, equipment or workmanship in which defects may develop and provide free service for all equipment and systems involved in the contract during this guarantee period. Beneficial use of any system by any of the Trade Contractors during construction does not constitute acceptance by the Owner. Time period of this beneficial use cannot be included in the guarantee period.

- C. Guarantee must also include restoration to its original condition of all adjacent work that is disturbed in fulfilling this guarantee.
- D. All such repairs and/or replacements must be made without delay and at the convenience of the Owner.
- E. Guarantees furnished by Trade Contractors and/or equipment manufacturers must be counter-signed by the related Trade Contractor for joint and/or individual responsibility for subject item.
- F. Manufacturers' equipment guarantees or warranties extending beyond the guarantee period described in item B above must be transferred to the Owner along with the Trade Contractor's guarantees.

1.14 ENTRANCE OF EQUIPMENT

- A. Determine the method of equipment entrance during initial site visit prior to bidding. Do not scale building openings, door widths and equipment or component sizes off the drawings. Determine sizes from site measurements and the equipment manufacturer. Include cost of equipment manufacturer's knockdown, use of field assembled equipment, field assembly, all work required for access, removals, replacements, general construction, and the like, as required. During preparation of submittals, verify whether knocked-down or pre-disassembled equipment have been proposed all to the extent required to permit entry of equipment to final location. Verify that the use of field assembled (not pre-assembled) equipment complies with manufacturer's warranty, guarantee, listings and requirements.
- B. Perform all necessary rigging required for completion of electrical work.
- C. Deliver products to the site properly identified with names, model numbers, types, grades, compliance labels and other information needed for identification. Deliver products and equipment to the site properly weatherproofed.
- D. The Trade Contractor who furnishes or purchases the product or equipment is responsible to provide and maintain protection from the weather, dust, dirt, construction debris, etc. until the project is complete.
- E. For all products and equipment which, when installed, have an opening into the building must be provided with a plywood cover, or similar protection, to prevent debris, rain, etc. from entering the building. The Trade Contractor who installs the product or equipment is responsible for such protection beginning at the time of installation.

1.15 VISIT TO SITE

- A. Due to the nature of the work involved under these Contract Documents, all bidders are required to thoroughly examine the site. Coordinate and schedule all site visits with the Owner.
- B. Thoroughly review Contract Documents prior to visiting the site, take Contract Documents to site and thoroughly explore to any extent necessary, the existing conditions as relating to fulfilling the requirements of these Contract Documents.
- C. If discrepancies are noted between requirements of Contract Documents and existing conditions, Trade Contractors must so indicate to Engineer during bidding period and receive clarification before bidding. Failure to comply with this requirement will result in Engineer's interpretation during the construction period such that the Engineer's decision will be final and binding as the sole interpreter of the contract requirements.
- D. Extras will not be considered for any work relating to connections with existing systems or adaptability of new systems to existing structures.
- E. Submission of proposals will be considered evidence that Trade Contractors have complied with the requirements of this Article.

1.16 REQUESTS FOR INFORMATION, RFI(s)

- A. Manage RFI(s) in a formal manner. Preparation and submission must comply with the process specified herein to be of maximum benefit to the project. RFI(s) which do not comply with this process will be returned without comment.
- B. All RFI(s):
 - 1. Must be submitted in written form to the party designated at the construction phase kick-off meeting;
 - 2. Must be consecutively numbered, dated, and logged as directed, during the kick-off meeting;
 - 3. Those which are follow-up RFI(s), must use the same RFI number, with a sequential submission number;
 - 4. Must list the RFI number of any reference RFI(s) used in the narrative;
 - 5. Must present: background; related drawings; specification articles; room, space locations (as designated on Contract Documents including wing, column line designation, floor designation, and/or north, south, and the like), and must be presented as complete, clearly written thoughts, in legibly printed or typed form;
 - 6. Must be completed by the Electrical Trade Contractor's Designated Project Foreman, under the control and overview of the Electrical Trade Contractor's Project Manager;
 - 7. Must include Electrical Trade Contractor's Project Foreman's suggested resolution to RFI;
 - 8. Must evidence a high level of fluency with the Contract Documents, all job progress correspondence, all Addenda, all Construction Bulletins, and specifically the Mechanical/Electrical Specifications including: Section 260010; the sections of

Division 21; Division 22; Division 23; Division 26; Division 27; Division 28; and special system and equipment divisions of the specification Divisions 02 thru 33 inclusive.

- C. The Electrical Trade Contractor's designated Project Manager must demonstrate familiarity with and responsibility for all RFI(s) prepared by the Project Foreman and must periodically submit an initialed log of RFI(s) signifying control of RFI(s) relating to specification and job scope issues.
- D. Issues relating to job scope, work included, methods and means which are either clearly discernable from the Contract Documents and/or clearly the responsibility of the Electrical Trade Contractor must be answered by his Project Manager and resolved between the Foreman and Project Manager prior to resorting to written RFI(s). The work of the Project Manager must evidence: fluency with the methods and means anticipated by the Electrical Trade Contractor during the bid phase to plan and complete the work; fluency with the Contract Documents, and all administrative issues related thereto.
- E. Items or issues which relate to non-compliance to associated codes or regulations must reference code interpretations or the published adopted code or regulation. The reference must be either an excerpt of the code or regulation, published addenda to the code or regulation, a formal interpretation written by a representative of the associated agency, or letter of non-compliance from the Authority Having Jurisdiction. All cited code requirements must include the applicable code title, code version or date, and code section number designation. If the RFI does not contain the required information, the RFI will be returned without comment.

1.17 AS-BUILT DRAWINGS

- A. Prepare reproducible (paper) and electronic (cd) record documents in AUTOCAD .dwg format (Version 2000 or later) in accordance with the requirements in Division 01. Use commercial CAD drafting service if Electrical Trade Contractor does not have CAD capabilities in-house. As an option, if requested by the Electrical Trade Contractor, an electronic copy (AutoCad .dwg format) of any of the Electrical Contract Drawings may be provided by the Engineer at a cost of \$55.00, billable to the requesting Contractor. In addition to the requirements specified in Division 01, indicate the following installed conditions:
 - 1. Indicate actual inverts and horizontal locations of underground electrical transmission and distribution equipment, and the like.
 - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines and annotated with permanent equipment number approved by Owner. Include code and equipment service clearances.
 - 3. Approved substitutions, Addenda and Bulletin Contract Modifications, and actual equipment and materials installed.
- B. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located, as specified in Division 01, to record the locations and invert elevations of the underground electrical work.

1.18 SERVICING OF EQUIPMENT AND SYSTEMS

- A. After work has been completed in accordance with the Contract Documents, and prior to final acceptance tests, each Trade Contractor must have manufacturers or their authorized agents of the equipment installed, completely check their equipment and put equipment into proper operation. In each case, the respective Trade Contractor must have the manufacturers thoroughly check the complete installation of the equipment, furnished by the manufacturer, for proper and correct operation under the service intended.
- B. Six months after final acceptance of the work under the Contract Documents, each of the Trade Contractors must have the manufacturers again check their equipment for proper operation and lubrication. Coincidentally, these Trade Contractors must assure that the Owner is properly instructed in the servicing of the equipment.
- C. Prior to expiration of the guarantee period, each Trade Contractor must check all equipment, materials and systems for which he is responsible, make necessary adjustments and/or replacements, and leave systems in first class operating condition.

1.19 SERVICING OF EQUIPMENT AND SYSTEMS (EXISTING/UNMODIFIED)

- A. Selected, designated existing electrical systems and equipment are planned to be continued in service upon project turnover, with no specified repair/modification covered under the Contract Documents. The Owner reserves the right to request repair/maintenance labor and materials, as an Owner requested change, depending on the results presented in the Electrical Trade Contractor's Evaluation Report.
- B. Perform inspection, evaluation, start-up and testing of the electrical systems and equipment listed below or as specified in Division 26, and prepare a full Electrical Evaluation Report listing: defects; deficiencies; required maintenance/repair labor and materials, all as required to restore unmodified systems and equipment to safe reliable code compliant use:
- C. Include within the Electrical Evaluation Report, a detailed breakdown of the proposed additional material and labor required to complete the recommended restoration(s).

1.20 CONTINUITY OF SERVICES

- A. Generally, no actions can be taken by the Electrical Trade Contractor that will interrupt any of the existing building services for these buildings or any other building until previously arranged and scheduled with the Engineer and Owner.
- B. Should any service be interrupted by the Electrical Trade Contractor, immediately provide all labor, including overtime if necessary, and all material and equipment necessary for restoration of such service, at no additional cost to the Project.

1.21 CONTINUITY OF INTERIOR BUILDING SERVICE UTILITIES

- A. For the purposes of this specification section, "Building Service Utilities" include, but are not limited to:
1. Exterior: electrical; domestic water; fire protection water; sanitary; storm; chilled water; space heating water; fuel lines; communication cable; fire alarm; remote metering lines; telemetry lines; and the like;
 2. Heating piping systems, complete;
 3. Chilled water piping systems, complete;
 4. Heating and process steam/condensate systems, complete;
 5. Ductwork systems, complete;
 6. Medical gas systems, complete;
 7. Fire protection systems, complete;
 8. Control systems, complete;
 9. Plumbing, drainage and storm systems, complete;
 10. Process piping systems, complete;
 11. Electrical conduit and wiring systems, complete;
 12. Electrical lighting and wiring devices, complete;
 13. Electrical fire alarm and security systems, complete;
 14. Electrical communication systems, complete.
- B. Building Service Utilities are defined for the purposes of this project, and as used in these specifications as:
1. TYPE A Utility System Services. New Internal Building Services, serving: new and/or modified system functions; new and/or modified equipment;
 2. TYPE B Utility System Services. Existing Internal Building Services serving: unmodified systems; unmodified equipment; building spaces for which mechanical and electrical systems, and internal operational equipment have not been modified by this project;
 3. TYPE C Utility System Services. Existing Utility Systems Building Services, external to the individual building, or buildings, addressed by the work of this project;
 4. TYPE D Utility System Services. New Utility Systems Building Services, external to the individual building, or buildings, addressed by the Work of this project.
- C. Plan work and schedule to prevent interruption of TYPE B, and/or TYPE C Utility System Services. Refer to the "Scope and Objectives of the Electrical Work," of this Section for a description of: unmodified systems, unmodified equipment; spaces wherein mechanical and electrical systems are unmodified; and Utility System Services external to the individual building or buildings addressed by the work of this project.
- D. Plan work and schedule installation and connections of TYPE A and TYPE D Utilities to minimize or prevent interruption of TYPE B, and or TYPE C Utility System Services. Refer to "General Requirements Electrical," Article "Scope and Objectives of the Electrical Work."
- E. The work required for continuity of these systems on this project includes, but is not limited to, providing all labor and material required for: site investigation/verification; disconnect; removal; rerouting; reconnection; as-built drawing documentation; testing

and check out of mechanical and electrical services serving equipment which are implied to be, or specifically indicated to be, continued in operation.

- F. All materials required for relocation work must comply with these specifications. Carefully review all phasing drawings, all Construction Trade drawings, and complete all necessary and prudent site visits to become familiar with all existing building operations, systems and equipment which may be continued, independent of the work of this project, and include all required relocation work described in this section.

1.22 TEMPORARY FACILITIES, UTILITIES AND HEATING

- A. Refer to Division 01 of these specifications.

1.23 SMOKE AND FIRESTOPPING (GENERAL)

- A. Furnish and install a material or a combination of materials to form an effective barrier against the spread of flame, smoke and gases, and to maintain the integrity of the "fire and/or smoke" rated construction. Refer to Division 07 of these specifications. Fire and smoke rated construction is identified on the Architectural Drawings. Provide firestopping in the following locations:
 - 1. Pipe and conduit penetrations through above grade floor slabs and through "fire and/or smoke"-rated partitions and fire walls.
 - 2. Penetrations of vertical shafts including, but not limited to pipe chases, duct chases, elevator shafts, and utility chutes.
 - 3. Other locations where indicated or required.
- B. Prepare submittals and submit for approval. Include manufacturer's descriptive data, typical details, installation instructions and the fire/smoke test data and/or report as appropriate for the time rated construction and location. The fire/smoke test data must include a certification by a nationally recognized testing authority that the material has been tested in accordance with ASTM E 814, or UL 1479 fire tests.
- C. Deliver materials in the original unopened packages or containers showing name of the manufacturer and the brand name. Store materials off the ground, and protect from damage and exposure to elements. Damaged, deteriorated or outdated shelf life materials shall not be used and must be removed from the site.

1.24 COORDINATION DRAWINGS

- A. The HVAC Trade Contractor will initiate preparation of coordination drawings, control original reproducible, collect, organize and facilitate the work/input of General Contractor and all other building trades relative to the 100% final submission of the coordination drawings. Prepare coordination drawings in accordance with Division 1 to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of electrical equipment and materials in relationship with other systems, installations, and building components. Use proposed equipment submittals, which include certified

dimensions, service clearances, etc., to prepare the coordination drawings. If equipment is submitted for review after completion of the coordination drawings and rejected during the submittal review process, because the equipment fails to meet the project specifications, the HVAC Trade Contractor is responsible to revise the coordination drawings and layout the work using equipment which meets the project specifications. HVAC Trade Contractor will designate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Proposed locations of conduit, pull boxes, equipment, and materials. Include the following:
 - a. Maximum physical separation to meet National Electrical Code requirements for feeder and secondary transformer tap lengths.
 - b. Clearances for servicing and maintaining equipment, including space for equipment disassembly required for periodic maintenance.
 - c. Equipment connections and support details.
 - d. Exterior wall and foundation penetrations.
 - e. Fire-rated wall and floor penetration.
 - f. Sizes and location of required concrete pads and bases.
 2. Scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Floor plans, elevations, and details to indicate penetrations in floors, walls and ceilings and their relationship to other penetrations and installations.
 4. Reflected ceiling plans to coordinate and integrate installation of air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling mounted items.
 5. The foregoing information and coordination work must be provided by the applicable Trade Contractor using the coordination drawings as initiated by the HVAC Trade Contractor.
 6. The HVAC Trade Contractor must submit completed coordination drawings for record purposes, not for technical review and approval, but as proof that the coordination drawings have been completed. The coordination drawings must be completed and submitted for record in advance of submission of sheet metal shop drawings.
- B. Coordinate with, and provide to the HVAC Trade Contractor, all electrical system and equipment information, locations and clearances required to prepare the coordination drawings.

1.25 TRADE CONTRACTOR'S CERTIFICATION

- A. Upon final completion of all work, each Trade Contractor must provide a notarized letter on Corporate letterhead, executed by a Corporate Officer, or Company Partner, stating that the work has been completed in accordance with the Contract Documents, Addenda, Bulletins, Trade Contractor's Punch List items and Architect's/Engineer's Construction Observation Report(s). Final Payment will not be approved until the notarized letter has been provided. Refer to the following sample letter.

SAMPLE LETTER

ENGINEER/ARCHITECT _____

TRADE CONTRACTOR _____

PROJECT _____ NO. _____

I hereby certify that all work under the HVAC, Plumbing, Fire Protection and Electrical Contract Documents, as applicable, including all addenda, bulletins, Punch List items and Construction Observation Reports, has been completed and the quality and workmanship of the work has been performed in accordance with Contract Documents.

State of: _____

County of: _____

Trade Contractor:

Subscribed and Sworn to before
me this _____ day of
20 _____

Notary Public:

By: _____

My Commission Expires:

Date: _____



PART 2 - PRODUCTS

2.1 MANUFACTURER'S AND SUB-CONTRACTORS LIST, KEYMEN RESUMES

- A. Before ordering any material or equipment unit, and not later than ten (10) working days after signing of contracts, submit a list of Manufacturers, Sub-Contractors and Suppliers showing make, type, manufacturer's name and trade designation of all materials, and equipment, proposed for use under this contract. Prepare list by reference to specifications. Identify all long lead submittals which will require an expedited submittal review.

- B. Refer to the Article "Proposal Preparation," in this section. Specifically designate the labor force required of the Electrical Trade Contractor. As part of the mobilization phase of the work, submit resumes for each Keyman including the Project Manager and Project Foreman.

- C. These lists, when approved, will be supplementary to specifications, and no variations therefrom will be permitted except with the approval of the Engineer.
- D. Prepare the list using the “PROPOSED MANUFACTURERS AND SUB-CONTRACTORS LIST” located at the end of this section.
- E. Submittals will not be processed until the requirements of this Article are satisfactorily completed.

2.2 SUBMITTALS

- A. Provide digital submissions (.pdf format) for all material and equipment as noted in Proposed Manufacturer's and Sub-Contractors List, except where indicated otherwise herein.
 - 1. Prior to submission of product data, shop drawings, and samples, notify the Engineer/Architect of any site conditions differing from those indicated or specified.
 - 2. Prior to submission of product data, shop drawings and samples to the design professional, the HVAC Trade Contractor, the Plumbing Trade Contractor and the Fire Protection Trade Contractor shall submit all submittals which require electrical power to the Project Electrical Trade Contractor for the HVAC Trade Contractor's, the Plumbing Trade Contractor's, the Fire Protection Trade Contractor's and the Electrical Trade Contractor's coordination and review. The Electrical Trade Contractor shall provide approval of electrical power requirements for the HVAC, Plumbing and Fire Protection Trade Contractors' proposed equipment.
 - 3. All submittals of equipment requiring electrical power must be accompanied by the “HVAC AND ELECTRICAL CONTRACTORS' COORDINATION OF HVAC EQUIPMENT ELECTRICAL REQUIREMENTS TRANSMITTAL COVER SHEET”, the “PLUMBING AND ELECTRICAL CONTRACTORS' COORDINATION OF PLUMBING EQUIPMENT ELECTRICAL REQUIREMENTS TRANSMITTAL COVER SHEET” and the “FIRE PROTECTION AND ELECTRICAL CONTRACTORS' COORDINATION OF FIRE PROTECTION EQUIPMENT ELECTRICAL REQUIREMENTS TRANSMITTAL COVER SHEET”, as applicable, all located at the end of this section. Submittals without this Cover Sheet or an incomplete Cover Sheet will be rejected without review.
 - 4. All submittals must be accompanied by the “ELECTRICAL CONTRACTOR'S TRANSMITTAL COVER SHEET” located at the end of this section. Submittals without this cover sheet or with an incomplete cover sheet, will be rejected without review.
 - 5. All submittals must be accompanied by the “ELECTRICAL SUBMITTAL LOG”, located at the end of this section. Submit log after final acceptance of the proposed Manufacturer's and Sub-Contractor's list. Revise and update the log with each submittal. Submittals without these logs or without an updated log will be rejected without review.
 - 6. Specifically annotate and sign all exceptions, deletions and additions that vary from the Project Contract Documents. Failing to provide signed annotations for all deletions and additions, recognize and accept that Contract Documents will govern, and will be used to resolve disputes.

- B. Prepare submittals by careful reference to: drawings and specifications; preparatory layout of all work; coordination with all proposed equipment; coordination with related submittals and the work of all other Trade Contractors; space requirements; and TYPE A, TYPE B, TYPE C, and TYPE D Utilities defined in this Section. A review of such submittals by the Engineer/Architect, which include drawings, schedules, and catalog cuts provided by the Trade Contractors, their Sub-Contractors, manufacturers, and vendors, shall not relieve the Trade Contractors from the responsibility for correcting all errors of any sort in the submittals, either identified or undetected by such review.
- C. Regularly provide and update submittal log sheets listing submittal number, product, applicable specification section, dates of submittal and receipt and status. Identify each submittal by Job Name, log number and reference to applicable Specification Article number.
- D. All equipment submittals must include, but not be limited to, the following:
1. Manufacturers' catalog designation, photographs and specifications.
 2. Full electrical data, including specifically, electrical characteristics.
 3. Full General Construction data, including operating weights, dimensional data including service access space. Data shall be given to the General Construction Trade Contractor, where applicable, for use in setting steel, supports, and attachments.
 4. Full wiring diagrams, including clearly identified power connections and control connections. Data and diagrams shall be given to the Automatic Temperature Control (ATC) Trade Sub-Contractor for their use and inclusion into their submittals.
 5. Listing of specific electrical performance, calculations and data.
 6. Dimensions, capacities, ratings, material and finish.
 7. Complete the submittal by listing all available options, accessories, configurations and materials, and legibly strike out with single thin line all proposed deletions. Clearly signify whether each and every manufacturer's option, accessory, configuration and material choice is included and which is excluded by the submission.
 8. Annotation of equipment, devices, systems as indicated by the Contract Documents (PNL-1, etc.).
 9. Certification of testing by agencies such as ETL, ARI, UL, etc.
 10. Such other detailed information as required for proper evaluation.
- E. Review Time:
1. Allow two (2) weeks after Engineer's receipt for the Engineer's processing of each submittal, exclusive of Owner's, or other's review in the processing chain. Allow a longer time period where processing must be delayed for coordination with subsequent submittals.
- F. Submittals for electric motor starters must include a tabulation listing the following:
1. The equipment the starter is intended to control.
 2. Horsepower and starter size.
 3. Voltage.

4. Phase.
 5. Full load amperes.
 6. The manufacturer's number or type.
 7. Heater numbers and amperage.
 8. Quantity of auxiliary contacts required by ATC and fire alarm systems.
 9. Pushbutton arrangement.
 10. Pilot light arrangement if applicable.
- G. Submittals for automatic temperature controls must be coordinated with: 1) all electrical equipment manufacturers' and vendors' submittals including review of electrical submittals by ATC Sub-Contractor for conformance with sequences of operation for each piece of equipment; 2) all electrical requirements of ATC System with Electrical Trade Contractor; and 3) all fire and safety requirements of the Fire Alarm System. ATC submittals shall include copies of all wiring diagrams for all electrical equipment with points of connections clearly identified. ATC submittals shall not be developed and submitted until Electrical Trade Contractor provides all equipment submittals for review.
- H. The Engineer's recommendation of acceptance of the equipment proposed by the Electrical Trade Contractor is conditional upon the Electrical Trade Contractor fulfilling all obligations of the Contract Documents. By furnishing the proposed equipment, the Electrical Trade Contractor acknowledges compliance with all of the following:
1. Field layout is completed and planning of proposed equipment has coordinated with all related submittals, related trades and space requirements.
 2. The Electrical Trade Contractor has reviewed and approved all submittals prior to submission. Provide all submittals with a signed approval stamp, signifying the following: 1) all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data have been verified; 2) the Engineer/Architect has been notified of all site conditions which affect the work, and which require design resolution, as opposed to resolution by trade decisions; 3) all items are approved by the Electrical Trade Contractor, and have been coordinated and checked with other applicable submittals, and contract requirements; 4) submission is clearly marked to indicate which manufacturer's options are provided and which are not provided for the proposed equipment; and 5) manufacturers and/or equipment suppliers have been given a set of the contract documents for their review and use as the basis of the submittals.
 3. Any and all exceptions requested by the Electrical Trade Contractor are provided in writing with the submittals. All exceptions, deletions and additions that vary from the Contract Documents have been specifically annotated and initialed. Failing to provide initialed annotations for all deletions and additions, the Electrical Trade Contractor accepts the condition that the Contract Documents will govern, and will be used to resolve disputes.
 4. Submittals without the Electrical Trade Contractor's signed stamp of approval will be returned without review. Initialed approval stamps are not acceptable.
 5. The Engineer's acceptance of the proposed equipment constitutes the Engineer's formal approval that the engineering performance and operational utility requirements, of the proposed equipment, match the Engineer's specified and designed performance requirements. By entering into these Contracts, the Trade Contractors agree that the purpose of submittals is to demonstrate to the Engineer

that the Trade Contractors understand the design concept and that they demonstrate their understanding by indicating which materials and equipment they intend to furnish, install and use.

- I. Secure submittals smaller than 8-1/2 x 11 to paper of this size.
- J. Material and equipment fabricated, furnished and/or installed or used without the Engineer's review are subject to rejection by the Engineer.
- K. Corrections or comments made on submittals during review by the Engineer do not relieve the Electrical Trade Contractor from compliance with the requirements of the Contract Documents. Such review will be only for general conformance with the design concept, and the information given in the Contract Documents and does not include review of quantities, dimensions, sizing, pressure drops, weights or gauges, fabrication processes, construction methods, coordination with the work of other trades, or construction safety precautions, all of which are the sole responsibility of the Electrical Trade Contractor. Review of a specific item does not indicate acceptance of an assembly of which the item is a component. The Engineer is not responsible for any deviations from the Contract Documents that are not clearly noted by the Electrical Trade Contractor. The Engineer will not review partial submissions or those for which submissions for correlated items have not been received. The Electrical Trade Contractor is responsible for: confirming and correlating all quantities, clearance, and dimensions; selecting fabrication processes and techniques of construction; coordinating work with all other Trades, and performing his work in a safe and satisfactory manner.
- L. All submittals must be able to be reproduced. The Electrical Trade Contractor is responsible for all reproduction and distribution to the General Construction Trade Contractor and all other Trade Contractors as applicable.
- M. If requested for the Electrical Trade Contractor's use in the preparation of submittals, an electronic copy (AutoCad .dwg format) of any of the Electrical Contract Drawings may be provided by the Engineer, after receipt of a signed indemnification agreement, at a cost of \$55.00, billable to the Electrical Trade Contractor.
- N. For additional requirements regarding submittals, refer to Article "Additional Trade Contractor Paid fees and Expenses" in Part 3 of this section.

2.3 MATERIALS AND EQUIPMENT

- A. All materials and equipment must be new and conform to the grade, quality and standards specified herein.
- B. All equipment offered under these specifications is limited to products regularly produced and recommended for service ratings in accordance with engineering data or other comprehensive literature made available to the public and in effect at the time of opening of bids. Testing agency seals, decals and/or nameplate shall be attached to and visible on all equipment.

- C. Items such as valves, motors, starting equipment, vibration isolating devices, and all other equipment and material, where applicable and practicable, must each be of one manufacturer.
- D. Install equipment in strict accordance with manufacturer's instructions for type and capacity of each piece of equipment used. Obtain these instructions, which will be considered part of these specifications. Type, capacity and application of equipment must be suitable and operate satisfactorily for the purpose intended in the electrical systems.

2.4 EQUIPMENT VARIATIONS AND SUBSTITUTIONS

- A. Equipment Substitution Definition as follows:
 - 1. A product that is neither the Basis of Design, nor one of the named Alternative Manufacturing Sources.
 - 2. Unless noted otherwise in the Contract Documents, substitutions may be considered after the award of Contracts. Subsequent requests will be considered only when, through no fault of the Electrical Trade Contractor, none of the specified products are available.
- B. Equipment Variation Definition as follows:
 - 1. A product that is not the Basis of Design, but is named as one of the specified Alternative Manufacturing Sources.
- C. The manufacturers listed in Part 2 of all technical specifications are considered Alternative Manufacturing Sources as described in Paragraphs A and B above.
- D. "Subject to compliance", as used in these specifications, means compliance with all the requirements of the Contract Documents.
- E. The materials and products mentioned in these Contract Documents are specified to establish a standard of: material of manufacture; independent testing agency certifications; quality; function; design; and performance. The phrases "Basis of Design," "standard of design," and "equivalent acceptable," are used to indicate that other similar, comparable products may be used provided such substitutes or variations are accepted by the Engineer as meeting all the salient characteristics and standards necessary, such as: material of manufacture; independent testing agency certifications; quality; function; design; and performance, to meet the Owner's needs and meet the objectives of the Engineer's Project Design.
- F. Where Alternative Manufacturing Sources are listed for an item:
 - 1. Selection must be either the Basis of Design or one of those listed Alternative Manufacturing Sources.
 - 2. There is no guarantee implied that each and every manufacturer listed can meet or exceed the salient characteristics, such as: material of manufacture; independent

testing agency certifications; quality; function; design; and performance of the product specified as Basis of Design.

- G. Each Trade Contractor is responsible to contact each proposed equipment manufacturer's representative and confirm, prior to preparing submittals, the proposed manufacturer's product meets or exceeds the: material of manufacture; independent testing agency certifications; quality; function; design; and performance of the product specified as the Basis of Design. Final acceptance will be determined by the Engineer, whose decision is final.
- H. Submittals offered as an Equipment Variation from the Basis of Design shall include a letter, on the product manufacturer's letterhead, certifying that the proposed product is a Comparable Product to the product specified as the Basis of Design and conforms to all the salient characteristics, including: material of manufacture; quality; function; design; and performance of the product specified as the Basis of Design. If directed by the Engineer for Products offered as an Equipment Variation, the Offerer shall provide a Letter of Confirmation from a Registered, Professional Engineer attesting that the Proposed Equipment Variation conforms to all the salient characteristics, including: material of manufacture; independent testing agency certifications; quality; function; design; and performance of the product specified as the Basis of Design.
- I. Specific products specified without use of the term: equal; equivalent; comparable product; substitution; or similar term; constitute a proprietary specification, and must be provided as specified, unless a written request is submitted to the Engineer for approval up to ten (10) days after the date of project award. Such requests must include a complete description of the proposed product, along with sufficient documentation and other information necessary for a complete evaluation of the proposed product. Such Trade Contractor Requests shall include a letter, on the product manufacturer's letterhead, certifying that the proposed product is a Comparable Product and conforms to all the salient characteristics, including: material of manufacture; independent testing agency certifications; quality; function, design; and performance of the specified product. If approved, the proposed product will be listed in an addendum to notify all bidders that such acceptance has been granted by the Engineer. If not approved, provide the specified product.
- J. Provide Calculations, signed and sealed by a Professional Engineer registered in the State in which the work is taking place, engaged by the Electrical Trade Contractor, confirming that the equipment proposed as either a Substitution, or Variation, is a Comparable Product to the product specified as the Basis of Design and conforms to all the salient characteristics, including: material of manufacturer; independent testing agency certifications; quality; function; design; and performance of the product specified as the Basis of Design. Provide such calculations for major pieces of equipment (emergency generators, switchgear, transformers, etc.). The Engineer, whose decision will be final, will determine which products will require calculations during the submittal review process.
- K. The Contract Documents have been founded upon Engineering Design selection of materials, products, and pieces of equipment listed at the Basis of Design. In the event that the incorporation of an approved Substitution, Variation, or assembly, into the work,

requires revisions or additions to the contractual requirements of either the Trade Contractor proposing the substitution or variation, or any other Trade Contractor, the Trade Contractor proposing the substitution or variation, shall bear the cost of: such revisions or additions to the work of the Trade Contractor proposing such Substitution and/or Variation; any expenses of all affected trades; and all engineering or architectural services required at no change in the contract sum.

- L. The equipment specifications indicated on the drawings, or in Part 2 of each of the technical specifications, may or may not indicate or include all of the required salient characteristics, components and accessories included with the specified product. Include cost for all such characteristics, components and accessories required to meet or exceed the: material of manufacture; independent testing agency certifications; quality; function; design; and performance of the product specified as the Basis of Design.
- M. For requirements regarding equipment variations after bid award, refer to Article "Additional Trade Contractor Paid Fees and Expenses" in Part 3 of this section.
- N. Each Trade Contractor negotiating for pricing advantages affecting the Trade Contractor's Bid shall comply with the directives included herein, bear full responsibility for the accuracy and completeness of the submissions required of the Vendor selected by the Trade Contractor. The Proposing Trade Contractor shall bear full responsibility for all extra costs of the Engineer shown to have resulted from inaccurate, and/or incomplete compliance with the directives included in this Specification Article.
- O. All decisions provided by the Engineer, described herein, shall be final.

2.5 VIBRATION ELIMINATION

- A. Provide vibration isolation support provisions for all moving or rotating equipment, machinery and transformers when such provisions are not furnished and/or integrally mounted by the equipment manufacturers. Basis of Design is Amber/Booth Company. Comparable product by Korfund Company, Inc. or Mason Industries may be submitted for review. Install in accordance with vibration isolation manufacturer's recommendations unless specified otherwise herein.
- B. Provide all rotating or moving machinery or equipment mounted on, or suspended from, building structure with approved resilient suspension isolation mountings.
- C. Provide vibration isolating connections between all pumps and connecting piping. Length, size, and stiffness as recommended by vibration isolator manufacturer.
- D. Use flexible metallic conduit for all electrical connections to moving or vibrating equipment, such as motors, generators, transformers, and the like.
- E. Rigid pipes, conduit or other extended machine assemblies connected to vibration isolated equipment are not permitted to be tied in directly with the building construction. Connect such elements to the equipment through flexible fittings, and support using isolating equipment as required.

- F. All systems must operate free from objectionable vibration and noise. Take all necessary steps required to achieve this result without additional cost to the Project.

2.6 NOISE CONTROL

- A. Noise levels in all 8 octave bands due to equipment and systems shall not exceed NC 35 within the occupied room, except as follows:

| <u>TYPE OF ROOM</u> | <u>NC LEVEL</u> |
|--|-----------------|
| Audio Suites, Audio Speech Pathology, Phono/Cardiology | 25 |
| Operating Rooms | 40 |
| Offices, large open | 40 |
| Lobbies, Waiting Areas | 40 |
| Corridors | 40 |
| Bath Rooms and Toilet Rooms | 40 |
| Laboratories | 45 |
| SPD, Dining Rooms, Food Service/Serving, Therapeutic Pools | 45 |
| Kitchens, Locker Rooms, Warehouses, Shop, Laundries, Gymnasiums, Recreation Rooms | 50 |
| X-Ray & General Work Rooms | 40 |

- B. For equipment which has no sound power ratings scheduled on the plans, select equipment such that the fore-going noise criteria, local ordinance noise levels, and OSHA requirements are not exceeded. Selection procedure shall be in accordance with ASHRAE 2015 HVAC Applications Handbook, Chapter 48, NOISE AND VIBRATION CONTROL.
- C. An allowance, not to exceed 5db, may be added to the measured value to compensate for the variation of the room attenuating effect between room test condition prior to occupancy and design condition after occupancy which may include the addition of sound absorbing material, such as, furniture. This allowance may not be taken after occupancy. The room attenuating effect is defined as the difference between sound power level emitted to room and sound pressure level in room.
- D. In absence of specified measurement requirements, measure equipment noise levels three feet from equipment and at an elevation of maximum noise generation.
- E. If sound levels are exceeded, provide sound reducing devices, including, but not limited to: sound attenuators; acoustic enclosures; additional equipment insulation or vibration isolators to conform to these specifications. Provide required material and labor at no additional cost to the project.

2.7 INSERTS, HANGER SUPPORTS, CLAMPS, FASTENINGS

- A. All materials, designs and types of inserts, hanger supports and clamps must meet the requirements of the latest edition of the Manufacturers Standardization Society Document MSS-SP-58, Underwriters Laboratories, Inc., National Electrical Code and Factory Mutual

Engineering Division Standards where applicable. Insert, hanger support and clamp types referenced herein are shown in MSS-SP-58.

- B. Provide all necessary inserts, hanger supports, fastenings, clamps and attachments necessary for support of the electrical work. Select the types of all inserts, hanger supports, fastenings, clamps and attachments to suit both new and existing building construction conditions specifically for the purposes intended.
- C. In new overhead cast-in-place concrete construction, provide type 19 steel concrete inserts and fasten to form work before concrete is cast. For cast concrete floor or roof sections too thin to permit the use of inserts, extend the hanger rod through the slab and terminate with a nut and large washer, recessed into the top face of the slab as approved by the Structural Engineer.
- D. Clamps and attachments to steel beams and bar joists must be made using types 20, 21, 23, 25, 27, 28, 29 or 30 as applicable to suit conditions of construction. Clamps and attachments must be selected on the basis of the required load to be supported. Provide all necessary steel angle iron or channel between bar joists, or steel beams where direct attachment cannot be made. Holes are not permitted to be drilled or burned in structural building steel for hanger rod supports. Welding of hangers or supports to structural steel is prohibited unless approved beforehand by the Structural Engineer.
- E. Metallic masonry anchors may be provided for all pre-cast concrete, masonry and cast concrete construction as an alternate to item (C) above. Locate in pre-cast and cast-in-place concrete as directed by the Structural Engineer. Anchor Basis of Design: Dynabolt, Ram-In and/or Tru-Bolt masonry anchors as manufactured by Ramset. Select and install as recommended by the anchor manufacturer for the various applications, stresses and services involved. Comparable products by Redhead, Hilti or Wej-It may be submitted for review. Installation of masonry anchors must be accomplished by pre-drilling concrete or masonry to diameters and depths required to properly accommodate anchor bolts.
- F. Toggle bolts may be used in dry wall and lath and block plaster walls. The use of toggle bolts is restricted to the weight limitations imposed by the toggle bolt manufacturer for the size used.
- G. Except where noted otherwise herein, attachment to wood or material of similar fibrous nature must be made with lag screws and/or wood screws of required size.
- H. Screws with wooden or plastic plugs, or lead anchors are not acceptable.

2.8 ACCESS DOORS AND PANELS

- A. For projects which include the work of a General Construction Trade Contractor, furnish and locate for installation under General Construction, all access doors and panels for concealed portions of electrical work requiring accessibility for operation and maintenance. If project does not include a General Construction Trade Contractor, provide access doors as required.

- B. Access doors and panels may not be installed without specific approval of the Architect/Engineer as to location. The proposed location of access doors and panels must be reviewed with the Architect/Engineer and the General Construction Trade Foreman, where applicable, and the locations indicated on the coordination drawings prior to installation of equipment, access doors or panels. Controversies must be resolved at no cost to the Project.
- C. Minimum size of 24" x 18" unless shown, specified or approved otherwise.
- D. Sixteen (16) gauge minimum construction with concealed spring hinges, screw fasteners and painted finish. Color by Architect.
- E. Subject to compliance with the requirements, provide products by one of the following:
 - 1. Milcor.
 - 2. Karp.
 - 3. Mifab.
- F. For access doors in drywall, provide drywall bead flange.
- G. For access doors in hard plaster or ceramic tile, provide expanded metal casing bead.
- H. For access doors in unplastered masonry and concrete, provide one piece frame for flush mounting.
- I. For access doors in acoustic tile ceilings, provide recessed door panel with room to receive acoustic tile.
- J. Underwriters "B" label access doors where required for access to shafts, corridors, and where located in fire walls and partitions.

2.9 PIPING AND CONDUIT SLEEVES

- A. Provide all sleeves required for electrical work and be fully responsible for the final and permanent locations thereof.
- B. Provide sleeves in the following locations:
 - 1. All pipes and conduits passing through all cast-in-place concrete construction and masonry walls.
 - 2. All pipes and conduits passing through cast-in-place waterproof concrete construction and waterproof masonry walls.
- C. Extend through construction and finish flush with each surface except where noted otherwise. Provide for a minimum 1/2" clearance around conduit, pipe or its covering in the instance of pipe covered with insulation.
- D. All sleeves in waterproof walls and floors must be fitted and sealed with positive hydrostatic mechanical seals. Provide Basis of Design Product "Link Seal" as

manufactured by Thunderline Corporation or Comparable Product by Advance Products and Systems, Inc. or Proco Products, Inc. Sleeves must be sized accordingly. Mechanical seals must be placed around piping and/or conduit and inserted into void between inner wall of sleeve and piping and/or conduit. Tighten mechanical seals as required for watertight seal.

- E. All sleeves must be Schedule 40 steel pipe finished with smooth edges. Sleeves in waterproof walls and floors must be fabricated with minimum 1/4" thick rectangular steel plate placed around mid-point of sleeve, continuously welded to sleeve and then place the entire/plate assembly into proper position prior to erection of walls and floors. Otherwise, provide sleeves with a minimum of three (3) lugs for anchoring.
- F. Pack voids between sleeves, piping or conduit, where located in fire or smoke rated assemblies, in accordance with UL Fire Resistance Directory.
- G. Set all sleeves prior to or during erection of walls and floors. In the event that sleeves are omitted or incorrectly located in new walls or slabs, submit a location plan and method of cutting and installing sleeves to the Engineer for review prior to carrying out the work.
- H. If sleeves are omitted or located incorrectly, the particular Trade Contractor who is at fault, at no additional cost to the project, must engage the trade which originally installed the work, to cut and patch to the satisfaction of the Engineer.
- I. Provide mechanical seals and insert into voids between piping and conduits that pass through floors, and which will be exposed in finished areas that have floor drains, including spaces classified as "Janitors Closets," "Toilet Rooms," and the like.
- J. Where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine, such as a masonry saw or core drill, to insure a neat hole.

2.10 SMOKE/FIRESTOPPING (MATERIALS)

- A. Firestopping materials and systems must consist of commercially manufactured products complying with the following minimum requirements and be asbestos and PCB free:
 - 1. Flame Spread Index: Twenty-five or less when tested in accordance with ASTM E 84.
 - 2. Smoke Density Index: Fifty or less when tested in accordance with ASTM E 84.
 - 3. Nontoxicity: Nontoxic to human beings at all stages of application and during fire conditions.
 - 4. Systems shall comply with Underwriter's Laboratory Listing Requirements.
 - 5. Fire Resistance:
 - a. Materials and systems used to seal penetrations in time rated assemblies must be capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 time temperature fire conditions for 3 hours.
 - b. Materials must not require a rise in temperature to install or activate seal.

- c. Materials must not contain solvents or require hazardous waste disposal.
 - d. Firestop material must not dissolve in water after curing.
- B. Basis of Design for smoke and firestopping materials is by Rectorshield, Inc. Comparable product by Hilti, or 3M may be submitted for review. Refer to Division 07 of these specifications.
- C. Smoke stopping materials must be approved by the authority having jurisdiction.

2.11 FIRE/SMOKE DAMPERS, SMOKE DETECTORS/SMOKE DETECTOR CONTROL

- A. All fire/smoke dampers for the project will be provided by the HVAC Trade Contractor.
- B. Refer to the Architectural Drawings, where applicable, for locations and classification ratings for all smoke and fire rated walls, floors and assemblies, new and existing.
- C. Duct mounted smoke detectors will be used to activate smoke dampers unless area detectors are used to activate smoke damper. Tie detectors into the building's fire alarm system. HVAC Trade Contractor will tie detectors into the Building Automation System (BAS) where applicable.
- D. Electrical Trade Contractor shall provide area smoke detectors for operation of smoke dampers as applicable and specified. Electrical Trade Contractor shall connect, then test and check-out smoke detectors connected to the building's fire alarm system as specified. Electrical Trade Contractor to check-out smoke detectors tied into the Building Automation System.
- E. All new duct mounted smoke detectors shall be furnished by the Electrical Trade Contractor and installed by the HVAC Trade Contractor, and shall be installed generally as located on the HVAC drawings.
- F. Connections for automatic shutdown of air handling units shall be provided by the HVAC Trade Contractor, in compliance with the ATC Section of these specifications. Connections for fire alarm system shall be provided by the Electrical Trade Contractor.
- G. HVAC Trade Contractor shall clearly indicate location of all new smoke detectors required in ductwork on sheet metal shop drawing submissions.
- H. Smoke evacuation system control and actuation shall be provided by the HVAC Trade Contractor, with detection and signal for the fire alarm system provided by the Electrical Trade Contractor.
- I. Area actuation signals and connections for smoke dampers shall be provided by the Electrical Trade Contractor. Locate signal where visible to Building Personnel.

PART 3 - EXECUTION

3.1 METHOD OF PROCEDURE

- A. The drawings accompanying these specifications are diagrammatic and intended to cover the approximate and relative locations of the building systems.
- B. Installation, connection and interconnection of all components of these systems must be complete and made in accordance with the manufacturers' instructions and best trade practices.
- C. Erect all parts of equipment furnished at such time and in such manner as not to delay or interfere with other Trade Contractors and their work.
- D. Plug all piping, conduit and ductwork as required during construction to prevent entering of dirt.
- E. Before material is ordered or fabricated, or any work is performed, verify all calculations, sizing, measurements, including lines, grades, pipes, and conduit elevations at the building, as applicable, and be responsible for the correctness thereof. No extra compensation will be allowed on account of differences between actual dimensions, routing and measurements and those indicated in the Contract Documents. Any discrepancies discovered must be submitted to the Engineer for consideration before proceeding with the work.
- F. Lay out work and be responsible for the establishment of heights, grades, and the like, for all interior and exterior equipment and systems as applicable, including piping, drains, fixtures, conduit, and the like, included in Contract Documents, in strict accordance with the intent expressed thereby; and all the physical conditions to be met at the building and finished grade, and be responsible for accuracy thereof. The establishment of the location of all work must be performed in consideration of the finished work. In case of conflict, equipment and/or materials must be relocated without cost to the Project, as directed by the Engineer, regardless of which equipment was installed first. Refer to Article, "Coordination Drawings", in Part 1 of this section.
- G. Cooperate with other Trade Contractors for the proper securing and anchoring of all work included within these specifications. Use extraordinary care in the erection and installation of all equipment and materials to avoid marring surfaces of the work of other Trade Contractors, as each Trade Contractor will be held financially responsible for all such injury caused by the lack of precaution and due to negligence on the part of the Trade Contractor's work force.
- H. Do not run pipe or conduit in any concrete slab three inches (3") or less in thickness. Do not place any pipe or conduit in any slab where the outside diameter of the pipe or conduit is more than one-quarter the thickness of the slab. The sweep of pipe or conduit elbows emerging through concrete slabs must not create any hazard or obstructions.
- I. All piping, conduit and other materials and equipment shown to be mounted below ceilings are to be kept as close to ceiling areas as possible unless otherwise noted.

- J. Install and arrange all equipment, such as junction boxes, and the like, which will be concealed in construction, to be fully accessible for adjustment, service and maintenance. Furnish access doors where required for installation under the General Construction Contract, where applicable. Otherwise, furnish and install all required access doors.

3.2 PROTECTION OF WORK

- A. Provide all piping, equipment, materials and accessories having polished or plated surfaces, machined finishes or unpainted surfaces with a thick coat of a neutral protection grease and carefully cover with thick cloth or heavy building paper held securely in place to protect the finish against damage during the entire period of construction. Protect equipment by the use of canvas tarps, vinyl sheeting or similar materials held securely in place.
- B. Seal all openings in pipes, fittings, conduit and all other materials to exclude dirt, sand, and other foreign materials.
- C. Exercise every precaution to exclude dust, dirt and all other foreign materials from switchgear rooms, transformers, and all mechanical equipment rooms during construction. Rooms and equipment contained therein must be swept and vacuum cleaned at regular intervals. All relays, meters and electrical equipment containing electrical components must be protected with heavy paper held in place with approved mastic tape to exclude fine dust and particles. Install and maintain sufficient electric heaters in equipment rooms and transformer compartments to keep equipment dry during construction.

3.3 CUTTING AND PATCHING

- A. New Construction:
 - 1. Perform cutting and patching in accordance with Division 01.
 - 2. Provide and set all sleeves, inserts and other items required for the installation of the electrical work, and take responsibility for their final and permanent locations.
 - 3. Confer with, and give the General Construction Trade Contractor, where applicable, complete information as to size of openings in all construction, so that such openings may be provided as the building progresses. Otherwise, provide openings as required for the electrical work.
 - 4. If openings are omitted or incorrect through failure to follow these instructions the particular Trade Contractor must, at no additional cost to the project, engage the trade which originally installed the work to cut and patch to the satisfaction of the Engineer.
- B. For existing construction:
 - 1. The General Construction Trade Contractor, where applicable, will perform all cutting and patching required for the work of all trades. Otherwise, all Trade Contractor are responsible for their own cutting and patching.

3.4 SUPPORTS

- A. Except where noted otherwise in the specifications and shown on drawings, provide all materials, including, but not limited to, equipment supports, supplies and labor necessary as required to adequately support, brace and strengthen new and/or existing equipment and materials installed under/or affected by the electrical work.
- B. The design, materials, fabrication and erection of structural steel supports must conform to "Specification for Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction, "Code of Standard Practice for Steel Buildings and Bridges". Welding, where required, must conform to "Code of Arc and Gas Welding in Building Construction" of the American Welding Society.

3.5 ESCUTCHEONS

- A. Except as noted otherwise, provide heavy solid pattern, steel, cast iron or malleable iron escutcheons with set screws and prime coat of paint on all conduit exposed to view within structure where passing through floors, partitions, walls or ceilings. Escutcheons are not required in equipment rooms, boiler rooms or other unfinished areas.
- B. Provide nickel plated cast iron escutcheons where conduits pass through toilet rooms, walls or ceilings.

3.6 PAINTING AND FINISHING

- A. All painting, generally, will be provided by the General Construction Trade Contractor, where applicable, except where specifically noted otherwise in the Electrical Specifications. Otherwise, all Trade Contractors are responsible for their own painting and finishing.
- B. Equipment and material furnished with factory enamel finish will not be painted unless finish has been damaged, in which case the equipment or material must be refinished by the Trade Contractor who furnished it, to the satisfaction of the Engineer.

3.7 LUBRICATION

- A. Provide proper and necessary lubrication of any items of operating, rotating or moving equipment which is furnished, installed or which must operate as part of the electrical system.
- B. When an item of operating equipment is furnished and installed by a Trade Contractor, it will be that Trade Contractor's responsibility to accomplish the lubrication.
- C. When an item of operating equipment is furnished by one Trade Contractor and installed by another, it is the responsibility of the Trade Contractor furnishing the equipment to apply the lubricants.

- D. All rotating or moving equipment must be lubricated prior to energizing and operating the equipment. Should the Trade Contractor responsible for the lubrication fail to apply lubricants prior to initial start-up and the equipment is damaged as a result of that Trade Contractor's negligence, that Trade Contractor is required to provide all corrective action necessary including replacement, if required, for the proper operation of equipment.
- E. Lubrication must be accomplished in the manner prescribed or recommended by the manufacturer of the specific item. For motor driven equipment this precaution of lubrication will apply individually to the driver and the driven component.
- F. The lubricants must be of the type, grade, specification and manufacture as prescribed or recommended by the manufacturer of the specific equipment item.
- G. Extend lubrication fittings where required to allow maintenance personnel to lubricate the equipment easily and efficiently.
- H. The Trade Contractor who supplies any item of rotating equipment will have the responsibility of securing written instructions on the lubricating procedure and must furnish not less than one year's supply of all necessary lubricants properly identified so they can be replaced.
- I. Any moving or rotating equipment furnished by the Owner that is to be installed, reused and/or serviced must also be lubricated. Except where noted otherwise in the Contract Documents, the Trade Contractor installing, reusing and/or servicing all such equipment is responsible for the proper lubrication thereof, including obtaining proper lubricating instructions from the various manufacturers involved, furnishing and applying the necessary lubricants and leaving the Owner with a one (1) year supply of lubricant.

3.8 ELECTRICAL TRADE COORDINATION

- A. Equipment by other Trade Contractors shall be furnished with electrical current characteristics as shown on electrical drawings and specifications.
- B. The nameplate voltage of all motors furnished with mechanical equipment must be within the range of the voltage shown for use with the motor as the upper limit, and 5% less than this voltage as the lower limit.
- C. Other Trade Contractors must furnish all motors, motor starters, specialty motor controllers, float and pressure switches, temperature control, other special automatic controls as indicated in the Contract Documents for all equipment furnished and/or installed under their contract except where noted otherwise.
- D. All electrical equipment furnished by other Trade Contractors must be as recommended by the equipment manufacturers, in accordance with the Electrical Specifications for similar items, and of such type as to work properly with automatic temperature control sequences where required.

- E. The Electrical Trade Contractor must provide all push-buttons, safety switches for motors, and wiring from starters to motors and install all starters furnished to him by other Trade Contractors unless otherwise indicated in the Contract Documents.
- F. Where controllers and/or starters are furnished as an integral part of any equipment, the Trade Contractor supplying the equipment must furnish complete wiring between controllers, starters and motors.
- G. The Electrical Trade Contractor must provide disconnect switches for all equipment furnished and/or installed by other Trade Contractors, except where such switches are an integral part of equipment.
- H. Other Trade Contractors must set all motors and furnish, set and pipe as necessary, float switches, temperature control and other special automatic temperature controls.
- I. Other Trade Contractors must provide all power and control wiring required by their respective section of the specification. The Electrical Trade Contractor must provide all other wiring required for the completion of the work of the other Trade Contractors.
- J. Other Trade Contractors must furnish the Electrical Trade Contractor with complete wiring diagrams as required.
- K. Any electrical work performed by the other Trade Contractors must be performed in accordance with the requirements of the ELECTRICAL Section of these specifications.
- L. For additional coordination items, refer to Article 2.2, "Submittals".

3.9 ELECTRICAL MOTORS AND STARTERS

- A. All motors furnished by all Trade Contractors, unless specified to the contrary in Contract Documents, must conform to the following requirements:
 - 1. Characteristics, dimensions, tolerances, temperature rise, insulation, rating, noise, vibration, and all other characteristics in accordance with the latest standards of IEEE or NEMA.
 - 2. Unless required by the driven unit, motors must have normal starting torque, NEMA Design B characteristics. Horsepower rating of motor must be equal to or greater than that required by driven equipment. Current density design of motor rating must be limited so that overload protection provided by standard motor starters will be adequate to prevent damaging overheating during stall, single phasing or slightly prolonged acceleration.
 - 3. Use NEMA Class A or B insulation with motor frames amply sized to provide a 1.15 service factor at an ambient of 40 deg. C maximum. Insulation systems must be designed for an average life of 60,000 hours.
 - 4. All motors must be high efficiency. Meet or exceed requirements in NEMA Standard MG1, Table 12-10.
 - 5. Running power factor must be higher than 0.85 for motors 5 HP to 30 HP and higher than 0.90 for motors 40 HP or larger.

6. Each motor must be mounted on the same bedplate as the equipment driven and be complete with pulleys, slide rails or flexible couplings as required.
 7. Each Trade Contractor is responsible in each instance for the proper selection of motors of suitable characteristics with details submitted for approval to the Engineer prior to installation.
- B. All starters furnished by all Trade Contractors must conform with the following requirements, unless specified to the contrary in the Contract Documents:
1. All starters for 3-phase equipment must be fully enclosed, across-the-line type equipped with solid state overload protection as herein specified for all three phases, low voltage protection, all necessary auxiliary contacts as required and indicating pilot lights. Starters which are controlled automatically must have two-wire control with "ON-OFF-AUTO" switches. Starters which are controlled manually must have 3-wire control with Start-Stop pushbuttons.
 2. All 3-phase starters remotely controlled must have 120 volt coils and control transformers with disconnecting means. Starters for single phase motors shall be manual toggle switches with thermal overload protection and pilot light. Omit pilot light for unit heaters.
 3. General Purpose NEMA-1 enclosure for indoor use under normal atmospheric conditions. Watertight enclosure NEMA-4 or NEMA-5 for outdoor use or where starters are subjected to the splashing or dripping of water. Explosion-proof enclosure NEMA-7, 9 or 12 for dusty or hazardous locations as required by Article 500 of the National Electrical Code.
 4. Individually equip all starters for three phase motors with solid state adjustable overload protection with automatic protection to prevent single phase operation with the following features:
 - a. Three phase, self-powered with current sensing, phase unbalance and phase loss protection, visible trip indication, trip test function, and power "LED."
 - b. Phase loss protection to include automatic restart with a selectable manual switch.
- C. All controllers, starters and other electrical components furnished as an integral part of any apparatus must be furnished complete with integral wiring as required.
- D. So far as is practical, all motors and starters must be of one manufacturer. Basis of Design: General Electric Co. Comparable products by Westinghouse Co., Square-D Co., or Allen-Bradley Co. may be submitted for review.
- E. Submittals for motors and starters must be coordinated with Electrical Trade Contractor.

3.10 ELECTRICAL PROVISIONS FOR PACKAGED MECHANICAL EQUIPMENT

- A. Unless otherwise noted in HVAC, Plumbing and Fire Protection Specifications, all packaged equipment furnished by HVAC, Plumbing and Fire Protection Trade Contractors must be complete with the following electrical provisions:

1. General compliance with provisions of the preceding Article, ELECTRICAL MOTORS AND STARTERS.
 2. Starting electrical characteristics of all motors and/or starters must be approved by local utility company and Electrical Engineer.
- B. Approved, factory installed and wired starting, operating and control equipment, terminating in terminal strip for single point power wiring connections by Electrical Trade Contractor must conform with the ELECTRICAL Section of these specifications and must include approved branch fuses for branch power circuits.

3.11 EQUIPMENT IDENTIFICATION

- A. Identify all equipment as to nature, service and purpose by means of permanently attached plastic nameplates having 1/2" high letters, dull black outside and white core. Nameplates of approved size, beveled edges and engraved through black to white core. Basis of Design for nameplates is Seton Corp. Comparable products by Marking Services, Inc. or Brady Worldwide may be submitted for review. Nameplates shall indicate equipment identification names and numbers as approved by the Owner.

3.12 ABANDONMENT, REMOVAL AND RELOCATION

- A. Perform all abandonment, removal and relocation work required for completion of electrical systems.
- B. Removals shown on drawings are a general indication only, and may not necessarily indicate the full extent of removals which may be required to complete this work.
- C. Where existing partitions, walls, ceilings and floors are to be removed, all piping, conduits, materials and equipment attached or fastened thereto or within, as applicable, must be carefully removed.
- D. Where work under this contract interferes with the existing construction, ductwork, piping, conduit or equipment, remove all such materials and route new work to clear the obstruction. Provide additional piping, conduits, and material of the same design and quality if the piping and/or conduit is to be continued in use.
- E. Disconnect and remove all accessible piping, conduit, ductwork, materials, fixtures and equipment not required in the new systems. Plug all outlets at the main or riser connection.
- F. Removed materials not desired by the Owner and not to be reset and not specified nor indicated to be reused, become the property of the Electrical Trade Contractor and must be promptly removed from site.
- G. All demolition work is subject to the direction and approval of the Engineer and must be performed in such manner as not to interfere with the normal operation of the building.

H. Relocate existing utilities and/or equipment that must remain to maintain operation of building or parts of building outside the work area.

I. Equipment Pad Removal:

1. Remove all concrete pads and equipment support structure material related to the Electrical Trade, not indicated or specified for reuse. Remove concrete pads to one (1) inch below adjacent concrete floor surface. Exterior slabs shall be broken and removed as waste materials.

2. Cut-off reinforcement and anchor bolts at or below level of pad removal.

a. Resurface area level with adjacent concrete floor surface using a heavy duty aggregate concrete topping consisting of Portland cement Type I or Type III conforming to ASTM C150 with aggregate graded by weight to pass sieves as follows:

| Fine (Thin Coat) | | or | Course (Heavy Coat) | |
|------------------|---------|----|---------------------|--------|
| 3/8" | 100% | | 1/2" | 100% |
| No. 4 | 95-100% | | 3/8" | 30-50% |
| No. 8 | 65-80% | | No. 4 | 0-15% |
| No. 16 | 45-65% | | No. 8 | 0-5% |
| No. 30 | 25-45% | | No. 100 | 0-5% |

b. Topping mix must contain a high range water reducing admixture (super plasticizer) ASTM C494, Type F or Type G.

c. Coat surface with epoxy bonding agent prior to application of concrete topping.

d. Produce a heavy duty concrete topping with the following characteristics:

| | |
|-----------------------|---------------------|
| Compressive Strength | 5000 psi at 28 days |
| Slump | 8" maximum |
| Water to Cement Ratio | 0.44. |

3.13 SMOKE AND FIRESTOPPING (METHODS)

A. Installation of materials must be performed by applicator/installers qualified, trained and approved by the manufacturer of the materials, and be installed in accordance with ASTM E 814.

B. Install smoke and firestopping at locations required, shown, or specified in accordance with applicable codes, manufacturer's written instructions, and test report, applying to the specific trade equipment as applicable. Cutting and patching of construction and providing sleeves, where required, is shown on drawings or specified in other sections.

1. Filling of Voids: Smoke and firestopping materials must completely fill void spaces regardless of geometric configuration, subject to tolerances established by the manufacturer. Smoke and firestopping for filling voids in floors in which the smallest dimension of the void is 4 in. or more must support the same load as the

floor is designed to support or must be protected by a permanent barrier to prevent loading or traffic in the smoke or firestopped areas.

2. Electrical Cables or Conduits: Smoke and firestopping at penetrations of electrical cables or conduits must comply with the requirements of NFPA No. 70.
3. Where smoke and firestopping of penetrations in floors, walls and partitions that will be exposed in completed construction, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and provide escutcheons or other trim.
4. Schedule the installation and required inspection of smoke and firestops for penetrations that will be concealed in completed construction prior to erection of floors, walls, and partitions that would permanently conceal the penetrations.

- C. All areas of smoke and firestopping installation must be accessible until inspection by the applicable code authorities.

3.14 TEMPORARY PARTITIONS

- A. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas. Refer to Division 01 of these specifications.

3.15 INITIAL APPLICATION FOR PAYMENT

- A. Provide the following prior to submitting the initial application for payment:
1. Copy of the Electrical Trade Contractor's and Sub-Contractors' licenses for the state in which the work is being performed.
 2. Resumes for the designated Project Manager and Project Foreman.
 3. List of independent agencies who will be engaged by the Electrical Trade Contractor to perform tests, provide certifications, conduct inspections, etc. as required by Contract Documents.
- B. The initial application for payment will not be processed until the items above are submitted.

3.16 FINAL APPLICATION FOR PAYMENT

- A. Provide the following prior to submitting the final application for payment:
1. Refer to Division 01 of these specifications.
 2. Equipment Start-Up Reports for each piece of electrical equipment.
 3. Electrical Inspection Agency's written report.
 4. Operating and Maintenance Manuals and Data.
 5. Electrical systems and equipment warranties.
 6. Electrical System Commissioning Report.
 7. Electrical Trade Contractor's Punch List of incomplete work items with reason why each work item is not complete and anticipated schedule for completion. Submit

at least one week prior to Engineer's final Construction Observation Report site visit.

8. Electrical Trade Contractor's notarized certification letter.
9. As-built drawings as described in Part 1 of this specification section.

B. Final payment is contingent upon completion of all items listed above.

3.17 INDEMNIFICATION

- A. The drawings and specifications covering the work of Division 26 shall not be interpreted by the Electrical Trade Contractor as quantification, and/or classification of the construction methods, and/or construction means required to carry out the required construction. There is no explicit or implicit representation that any portion of this work can be installed and/or constructed through any particular normal, reasonable, abnormal, or unusual means and methods. By submission of a pricing bid for this work, the Electrical Trade Contractor shall accept sole and individual responsibility for the determination and execution of the methods and means selected to complete this work.
- B. The Electrical Trade Contractor, to the fullest extent permitted by law, agrees to indemnify, hold harmless, and defend Gillan & Hartmann, Inc., its consultants, and the employees and agents of any of them from and against any and all claims, suits, demands, liabilities, losses, damages, and costs ("Losses"), including but not limited to costs of reasonable defense, arising in whole or in part out of the negligence of the Electrical Trade Contractor, his Sub-Contractors, the officers, employees, agents, and Sub-Contractors of any of them, or anyone for whose acts any of them may be liable, regardless of whether or not such Losses are caused in part by a party indemnified hereunder. Specifically excluded from the foregoing are Losses arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, and (2) the giving of or failure to give directions by Gillan & Hartmann, Inc., its consultants, and the agents and employees of any of them, provided such giving or failure to give is the primary cause of Loss.
- C. The Electrical Trade Contractor shall name Gillan & Hartmann, Inc., its agents and consultants on the Electrical Trade Contractor's policy or policies of comprehensive or commercial general liability insurance. Such insurance shall include products and completed operations and contractual liability coverages, shall be primary and noncontributing with any insurance maintained by Gillan & Hartmann, Inc. or its agents and consultants, and shall provide that Gillan & Hartmann, Inc. be given thirty days, unqualified written notice prior to any cancellation thereof.

3.18 ADDITIONAL ELECTRICAL TRADE CONTRACTOR PAID FEES AND EXPENSES

A. As a material part of the Electrical Trade Contractor's Agreement to complete the work of this Contract, the Electrical Trade Contractor agrees to reimburse Gillan & Hartmann, Inc. ("Engineer") for the below listed extra engineering work under the following conditions:

1. Engineer's hourly billing rate shall be \$250.00 per hour for all related office hours, travel time and as applicable, on-site time;

2. Electrical Trade Contractor's request(s) for substitution;
 - a. When such requests for substitution are not the result of a bonafide delivery problem or design related problem, and;
 - b. When such requests do not address items of equipment for which the specifications list the basis of design with at least one comparable product, and;
 - c. The Electrical Trade Contractor's request(s) for substitution must be submitted in writing, and;
 - d. The Engineer will provide the Electrical Trade Contractor with a written budget, not to exceed quotation for the Engineer's billing, and;
 - e. The Electrical Trade Contractor shall render written acceptance of the Engineer's extra charges, and;
 - f. The Electrical Trade Contractor shall pay a retainer, in advance, equal to 80% of the established budget for the Engineer's extra work.
 - g. The balance of the Engineer's charges beyond the retainage shall be paid upon completion of the Engineers' extra work in reviewing the substitution(s). Final payment is due regardless of the Engineer's decision to accept or reject the Electrical Trade Contractor's substitution request(s), and;
 - h. Late payments shall incur an interest rate of 1½% per month compounded from due date to date of collection, and;
 - i. The Electrical Trade Contractor's balance due for his/her beneficial contracted work, unpaid beyond 60 days of due date, will be deducted from progress payments due the Electrical Trade Contractor, and will include all additional administrative costs incurred by the Owner, in affecting such deductions.

3. Extra Engineering work created by the Electrical Trade Contractor's failure to resolve the Engineer's Items listed in the Construction Observation Report(s);
 - a. The Engineer's basic services rendered to the Owner include periodic visits to the site and providing written list of items (Construction Observation Report) requiring the Electrical Trade Contractor's attention, reporting and resolution;
 - b. The Electrical Trade Contractor shall provide written feedback and prompt resolution of Construction Observation Items including a written schedule for the Electrical Trade Contractor's completion of these Items followed by a written confirmation of closure;
 - c. Should the Electrical Trade Contractor fail to perform as described above, and should such failure require, in the opinion of the Owner and the Engineer, that the Engineer must expend extra work in bringing closure and resolving the Electrical Trade Contractor's open Items, the Electrical Trade Contractor agrees pay the Engineer for all extra work required. The Engineer will provide a written notice of the not to exceed budget for the Engineer's extra work in advance as a prudent notification that the extra work will be initiated. Subsequent failure of the Electrical Trade Contractor to resolve these outstanding issues will result in the Engineer's completion of the extra work, and billing the Electrical Trade Contractor accordingly. The Engineer's payment for this additional work shall be deducted from the Electrical Trade

Contractor's final payment for the work under this Contract. Deductions from the Final Payment will be made to cover all the Owner's additional costs in affecting such deductions.

4. The Electrical Trade Contractor's request for substitution of specified equipment when such specifications list a basis of design and at least one comparable product such requests will be rejected.
5. Extra Engineering work created by the Electrical Trade Contractor's multiple submissions of a single material or piece of equipment;
 - a. The Engineer's basic services include two reviews for each piece of equipment or material submittal. The Engineer's first review takes place at the initial Electrical Trade Contractor's submission of that submittal. The Engineer's second review takes place when the Engineer requires a resubmission of that submittal.
 - b. If the Engineer's third review of a particular submittal is required for reasons due to the Electrical Trade Contractor, the Engineer will provide the Electrical Trade Contractor with a written budget, not to exceed quotation for the Engineer's extra work in reviewing the submittal.
 - c. The Electrical Trade Contractor shall render written acceptance of the Engineer's extra charges.
 - d. The Electrical Trade Contractor shall pay a retainer, in advance, equal to 80% of the established budget for the Engineer's extra work.
 - e. The balance of the Engineer's charges beyond the retainage shall be paid upon completion of the Engineers' extra work in reviewing the submittal.
 - f. Late payments shall incur an interest rate of 1½% per month compounded from due date to date of collection.
 - a. The Electrical Trade Contractor's balance, unpaid beyond 60 days of due date, will be deducted from progress payments due the Electrical Trade Contractor for work under this Contract and will include additional administrative costs incurred by the Owner in affecting all such deductions.

PROJECT NAME:
Gillan Hartmann, Inc.
ELECTRICAL SHOP DRAWING LOG

JOB NO.:
DATE: 5/25/2016

| ITEM NO. | PROPOSED DATE OF | ACTUAL DATE OF SUBMITTAL | MFR. OR CONTRACTOR | DESCRIPTION | DESIGN PROFESSIONAL'S ACTION | DATE RETURNED | RE-SUBMIT | Checked by |
|----------|------------------|--------------------------|--------------------|-------------|------------------------------|---------------|-----------|------------|
| E-01 | | | | | | | | |
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| E-19 | | | | | | | | |

Status: Pending (P); Furnish as Submitted (FAS) Furnish As Noted (FAN); Rejected (RE); No Submission Required (NSR)

Contractor's Submittal Description: _____, Project _____
(Fill In) (Fill In)

ELECTRICAL CONTRACTOR'S TRANSMITTAL COVER SHEET

TO: GILLAN & HARTMANN, INC.
CONSULTING ENGINEERS
P.O. BOX 345
VALLEY FORGE, PENNSYLVANIA 19481

| | |
|----------------------------|---|
| Date of Transmittal: _____ | By Contractor: _____ Contractor's Authorized Staff Signature: _____ Print Name: _____ Project: _____ |
|----------------------------|---|

By executing this Transmittal Cover, the Contractor agrees and accepts that:

- Submittals without the HVAC/Plumbing/Fire Protection and Electrical Contractor's signed stamp of approval will not be reviewed. Initialed approval stamps are not acceptable. All resulting resubmittals will be provided at the Contractor's expense.
- The Engineer's recommendation of acceptance ("Furnish as Submitted", "Furnish as Noted Below", etc.) of the equipment proposed by the Contractor is conditional upon the Contractor fulfilling all obligations of the Contract Documents. By furnishing the proposed equipment, the Contractor acknowledges compliance with all of the following:
 - The Contractor has completed field layout and planning of proposed equipment and has coordinated all other related shop drawings, related trades involved in Project Construction, and all space requirements.
 - The Contractor has examined all shop drawings prior to submission. The Contractor forwards all shop drawings with a signed approved stamp, signifying the following:
 - 1) All field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data have been verified.
 - 2) The Architect/Engineer has been notified of all site conditions which affect the work, and which require design resolution beyond resolution by Trade contractors' Field Decisions;
 - 3) All items herein are approved by the Contractor, and have been coordinated and checked with other applicable submittals, and contract requirements;
 - 4) Submission is clearly marked to indicate which manufacturer's options are provided and which are not provided with the proposed equipment.
 - Any and all exceptions requested by the HVAC/Plumbing/Fire Protection and Electrical Contractors have been included in written form. All exceptions, deletions, and additions that vary from the Contract Documents have been specifically annotated and initialed. Failing to provide the initialed annotations for all deletions and additions, the Contractor accepts the condition that the Contract Documents will govern, and will be used to resolve disputes.
 - All Engineer's notes regarding this submission must be incorporated into the Project.
 - The Engineer's review is limited to comparison of the technical performance of the Contractor's proposed equipment to the specified technical performance.
 - Equipment submittal is either the Basis-of-Design, or a comparable product to the Basis-of-Design.
 - A Comparable Product must meet or exceed all the salient characteristics and standards necessary including, but not limited to: material of manufacture; independent testing agency certifications; quality; function; design; and performance required to meet the Owner's needs and meet the objectives of the Professional's Project Design.
 - Extension of Contract Time and/or claim for delay are not acceptable as created by the Trade Contractor's failure to provide submittals on a timely basis to permit the processing work of the Professional, including multiple resubmittals, and/or failure to provide submittals that are comparable to the Basis of Design Product. Refer to EQUIPMENT VARIATIONS AND SUBSTITUTIONS article in the General Requirements Section of the Specifications.

G&H Project No: _____

G&H Shop Drawing Review No: _____ E-_____

END OF SECTION 260010

SECTION 260050 - BASIC ELECTRICAL MATERIALS AND METHODS

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. Supporting devices for electrical components.
 - 2. Electrical identification.
 - 3. Electrical demolition.
 - 4. Cutting and patching for electrical construction.
 - 5. Touchup painting.

1.3 SUBMITTALS

- A. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.5 COORDINATION

- A. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
- B. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces.

- C. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.
- D. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.
- E. Electrical devices and boxes are indicated on Drawings in approximate locations unless dimensioned. Adjust box or device location up to 10 feet, if required to accommodate intended purpose or owner request, with no additional cost to contract.

PART 2 - PRODUCTS

2.1 SUPPORTING DEVICES

- A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
- B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.
- C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch diameter slotted holes at a maximum of 2 inches o.c., in webs.
 - 1. Channel Thickness: Selected to suit structural loading.
 - 2. Fittings and Accessories: Products of the same manufacturer as channel supports.
- D. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, and wall brackets.
- E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- F. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.
- G. Expansion Anchors: Carbon-steel wedge or sleeve type.
- H. Toggle Bolts: All-steel springhead type.

- I. Powder-Driven Threaded Studs: Heat-treated steel.

2.2 ELECTRICAL IDENTIFICATION

- A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
- B. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.
 - 1. Type: Preprinted, flexible, self-adhesive, vinyl. Legend is over laminated with a clear, weather- and chemical-resistant coating.
 - 2. Color: Black letters on orange background.
 - 3. Legend: Indicates voltage.
- C. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick (25 mm wide by 0.08 mm thick).
- D. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 - 1. Not less than 6 inches wide by 4 mils thick (150 mm wide by 0.102 mm thick).
 - 2. Compounded for permanent direct-burial service.
 - 3. Embedded continuous metallic strip or core.
 - 4. Printed legend that indicates type of underground line.
- E. Tape Markers for Wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- F. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.
- G. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background.
- H. Interior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Preprinted, aluminum, baked-enamel-finish signs, punched or drilled for mechanical fasteners, with colors, legend, and size appropriate to the application.

- I. Exterior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm), galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch (6-mm) grommets in corners for mounting.
- J. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

2.3 TOUCHUP PAINT

- A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
- B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

- A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
- B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 ELECTRICAL SUPPORTING DEVICE APPLICATION

- A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.
- B. Dry Locations: Steel materials.
- C. Support Clamps for PVC Raceways: Click-type clamp system.
- D. Selection of Supports: Comply with manufacturer's written instructions.
- E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb (90-kg) design load.

3.3 SUPPORT INSTALLATION

- A. Install support devices to securely and permanently fasten and support electrical components.
- B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
- C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
- D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
- E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
- F. Install 1/4-inch- (6-mm-) diameter or larger threaded steel hanger rods, unless otherwise indicated.
- G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch (38-mm) and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.
- H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
- I. Simultaneously install vertical conductor supports with conductors.
- J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches (610 mm) from the box.
- K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.
- L. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
 - 1. Wood: Fasten with wood screws or screw-type nails.
 - 2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
 - 3. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.
 - 4. Steel: Welded threaded studs or spring-tension clamps on steel.

- a. Field Welding: Comply with AWS D1.1.
5. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
6. Light Steel: Sheet-metal screws.
7. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.4 IDENTIFICATION MATERIALS AND DEVICES

- A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.
- D. Identify raceways and cables with color banding as follows:
 1. Bands: Pre-tensioned, snap-around, colored plastic sleeves or colored adhesive marking tape. Make each color band 2 inches (51 mm) wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
 2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (8-m) maximum intervals in congested areas.
 3. Apply the following colors to the systems listed below:
 - a. Fire Alarm System: Red.
 - b. Fire-Suppression Supervisory and Control System: Red and yellow.
 - c. Combined Fire Alarm and Security System: Red and blue.
 - d. Security System: Blue and yellow.
 - e. Mechanical and Electrical Supervisory System: Green and blue.
 - f. Telecommunication System: Green and yellow.
- E. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.
- F. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
 1. Phase A: Black.
 2. Phase B: Red.
 3. Phase C: Blue.

4. Neutral: White.
 5. Ground: Green.
- G. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
1. Phase A: Yellow.
 2. Phase B: Brown.
 3. Phase C: Orange.
 4. Neutral: White with a colored stripe or gray.
 5. Ground: Green.
- H. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
- I. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.
- J. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high lettering on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:
1. Panelboards, electrical cabinets, and enclosures.
 2. Access doors and panels for concealed electrical items.
 3. Electrical switchboards.
 4. Disconnect switches.
 5. Enclosed circuit breakers.
 6. Motor starters.
 7. Push-button stations
 8. Contactors.
 9. Control devices.
 10. Transformers.

3.5 FIRESTOPPING

- A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in applicable Division 07 Sections.

3.6 DEMOLITION

- A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.
- C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches (50 mm) below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.
- D. Remove demolished material from Project site.
- E. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.7 CUTTING AND PATCHING AND PAINTING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.8 FIELD QUALITY CONTROL

- A. Inspect installed components for damage and faulty work, including the following:
 - 1. Raceways.
 - 2. Building wire and connectors.
 - 3. Supporting devices for electrical components.
 - 4. Electrical identification.
 - 5. Electrical demolition.
 - 6. Cutting and patching for electrical construction.
 - 7. Touchup painting.

3.9 REFINISHING AND TOUCHUP PAINT

- A. Refinish and touch up paint. Paint materials and application requirements are specified in applicable Division 09 Sections.
 - 1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
 - 2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
 - 3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.10 CLEANING AND PROTECTION

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 260050

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS

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. Copper building wire rated 600 V or less.
 - 2. Metal-clad cable, Type MC, rated 600 V or less.
 - 3. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. VFC: Variable-frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- D. Conductor Insulation:
 - 1. Type THHN and Type THWN-2: Comply with UL 83.
 - 2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.

2.2 METAL-CLAD CABLE, TYPE MC

- A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.
- B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Comply with UL 1569.
 - 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- D. Ground Conductor: Insulated.
- E. Conductor Insulation:
 - 1. Type TFN/THHN/THWN-2: Comply with UL 83.
 - 2. Type XHHW-2: Comply with UL 44.
- F. Armor: Steel.
- G. Jacket: PVC applied over armor.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Material: Copper.
 - 2. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
- C. VFC Output Circuits Cable: Extra-flexible stranded for all sizes.
- D. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Branch Circuits including Branch Circuits in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- B. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN single conductors in raceway: MC 3-conductor cable with 90 degree-C insulation may be used for concealed branch circuits in lieu of wire in conduit, where allowed by local and national codes.
- C. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- D. Class 2 Control Circuits: Type THHN-THWN in raceway.
- E. Control Wiring Less Than 120V and Power Limited Systems: Provide in accordance with system manufacturer's recommendations and in accordance with NEC Article 725.
- F. Use conductor not smaller than 12AWG for power circuits.
- G. Use conductor not smaller than 14AWG for control circuits.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260050 "Basic Electrical Materials and Methods."

3.4 CONNECTIONS

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

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to specification 260050 "Basic Electrical Materials and Methods."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260050 "Basic Electrical Materials and Methods."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to applicable specification sections.

3.8 FIELD QUALITY CONTROL

- A. Testing: Provide the following tests:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
 - 2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
- B. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

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 grounding and bonding systems and equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency and testing agency's field supervisor.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in "Operation and Maintenance Data," include the following:
 - a. Instructions for periodic testing and inspection of grounding features at test wells, and ground rings based on NFPA 70B.
 - 1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - 2) Include recommended testing intervals.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

- A. Insulated Conductors: Tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

2.3 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Conductor Terminations and Connections:
- C. Install insulated equipment grounding conductors with all feeders and branch circuits.
- D. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Branch circuits.
 - 2. Lighting circuits.

3. Receptacle circuits.
4. Flexible raceway runs.
5. Armored and metal-clad cable runs.

3.2 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- C. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
 2. Make connections with clean, bare metal at points of contact.
 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections with the assistance of a factory-authorized service representative.
- D. Tests and Inspections:
 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- E. Grounding system will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.
- G. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 3. Substations and Pad-Mounted Equipment: 5 ohms.
 4. Handhole Grounds: 10 ohms.
- H. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

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 conduits and fittings.
 - 2. Nonmetallic conduits and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Surface raceways.
 - 5. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.5 COORDINATION

- A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension systems with other construction that penetrates ceilings or is supported by them, including but not limited to lighting fixtures, HVAC equipment, fire-suppression system, and partition assemblies.
- B. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.
- C. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. IMC: Comply with ANSI C80.6 and UL 1242.
4. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
 - a. Comply with NEMA RN 1.
 - b. Coating Thickness: 0.040 inch, minimum.
5. EMT: Comply with ANSI C80.3 and UL 797.
6. FMC: Comply with UL 1; zinc-coated steel.
7. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
5. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: compression.
6. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
7. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

- #### **C. Joint Compound for IMC or GRC, Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.**

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
3. LFNC: Comply with UL 1660.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
 - a. Fittings for LFNC: Comply with UL 514B.
3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- C. Wireway Covers: Hinged type unless otherwise indicated.
- D. Finish: Manufacturer's standard enamel finish.

2.4 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.
- C. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

2.5 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, Type FD, with gasketed cover.
- D. Metal Floor Boxes:
 - 1. Material: Cast metal for applications at grade level or sheet metal above grade.
 - 2. Shape: Rectangular.
 - 3. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- I. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- J. Cabinets:
 - 1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit Below Roof: IMC.
 2. Rooftop: IMC with screw couplings and expansion joints as required.
 3. Concealed Conduit, Aboveground: GRC or IMC.
 4. Underground Conduit: RNC, Type EPC-40-PVC.
 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 6. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed and Subject to Severe Physical Damage: GRC or IMC. Raceway locations include the following:
 - a. Loading areas.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Gymnasiums.
 3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 5. Damp or Wet Locations: GRC or IMC.
 6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 3. EMT: Use compression, steel or cast-metal fittings. Comply with NEMA FB 2.10.
 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

- E. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as specified in Specification Section 260050 "Basic Electrical Materials and Methods."
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Change from ENT to RNC, Type EPC-40-PVC, rigid steel conduit, or IMC before rising above floor.
- I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- L. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where otherwise required by NFPA 70.
- M. Flexible Conduit Connections: Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations.
- N. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

3.3 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Coordinate sleeve selection and application with selection and application of firestopping specified in applicable Division 07 Sections.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Rectangular Sleeve minimum Metal Thickness:
1. For sleeve cross-section rectangle perimeter less than 50-inches and no side greater than 16-inches, thickness shall be 0.052 inch.
 2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches and 1 or more sides equal to, or greater than, 16-inches, thickness shall be 0.138 inch.
- E. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- F. Cut sleeves to length for mounting flush with both surfaces of walls.
- G. Extend sleeves installed in floors 2-inches above finished floor level.
- H. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway unless sleeve seal is to be installed or unless seismic criteria require different clearance.
- I. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
- J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway, using joint sealant appropriate for size, depth, and location of joint. Refer to applicable Division 07 Sections for materials and installation.

- K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway penetrations. Install sleeves and seal with firestop materials. Comply with applicable Division 07 Sections.
- L. Roof-Penetrations Sleeves: Seal penetration of individual raceways with flexible, boot-type flashing units applied in coordination with roofing work.
- M. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- N. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch annular clear space between raceway and sleeve for installing mechanical sleeve seals.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install to seal underground, exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.5 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in applicable Division 07 Sections.

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260923 - LIGHTING CONTROL DEVICES

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. Low Voltage Indoor occupancy sensors with auxiliary relays for lighting control of light fixtures.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Show installation details for the following:
 - a. Occupancy sensors.
 - 2. Interconnection diagrams showing field-installed wiring.
 - 3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Provide shop drawing for occupancy sensors
- B. Field quality-control reports.
- C. Sample Warranty: For manufacturer's warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Faulty operation of lighting control devices.
 - 2. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 INDOOR OCCUPANCYSENSORS

- A. General Requirements for Sensors:
 - 1. Ceiling-mounted, solid-state indoor occupancy sensors.
 - 2. Provide Dual technology (Ultrasonic and Passive Infrared).
 - 3. Provide power pack as required.
 - 4. Hardwired connection to switch.
 - 5. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 6. Operation:
 - a. Occupancy Sensor: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes and set for 30 minutes.
 - b. Combination Sensor: Unless otherwise indicated, sensor shall be programmed to turn lights on when coverage area is occupied and turn them off when unoccupied, or to turn off lights that have been manually turned on; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes and set for 30 minutes.
 - 7. Provide Power Packs and Relays as required for a fully functional installation.
 - 8. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.
 - b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
- B. Dual-Technology Type: Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.

1. Sensitivity Adjustment: Separate for each sensing technology.
2. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of not less than 36 sq. in, and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
3. Detection Coverage: Detect occupancy anywhere within a circular area of 1000sq. ft. when mounted on an 8 foot high ceiling.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

- A. Comply with NECA 1.
- B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate lighting control devices and perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspection with the assistance of a factory-authorized service representative:
 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- D. Lighting control devices will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
 - 1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
 - 2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
 - 3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.5 DEMONSTRATION

- A. Coordinate demonstration of products specified in this Section with demonstration requirements for low-voltage, programmable lighting control systems.
- B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 260923

SECTION 262726 - WIRING DEVICES

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. Key switches.
 - 2. Wall plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

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

- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 - 2. Devices shall comply with the requirements in this Section.
- D. Devices for Owner-Furnished Equipment:
 - 1. Receptacles: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.
- E. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 KEY SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:
- C. Key-Operated Switches: 120/277 V, 20 A.
 - 1. Description: Single pole, with factory-supplied key in lieu of switch handle.

2.3 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: 0.035-inchthick, satin-finished, Type 302 stainless steel with color as specified by the Architect.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.4 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Emergency Power System: Red.

- B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.

5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.
- G. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

- A. Comply with specifications for "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. Using the test plug, verify that the device and its outlet box are securely mounted.
 5. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- B. Wiring device will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 265119 - INTERIOR LIGHTING

PART 1 – GENERAL

1.1 STIPULATIONS

- A. The specifications section “General Conditions”, “Special Requirements” and “General Requirements” form a part of this Section by this reference thereto and shall have the same force and effect as if printed herewith in full.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. This Section includes the following:
 - 1. Interior LED lighting fixtures.
 - 2. Lighting fixture supports.

1.4 SUBMITTALS

- A. LED Light Fixture Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of lighting fixture including dimensions.
 - 2. The shop drawing shall include the “L70 Rating” for each light fixture, indicating compliance with a minimum L70 of 50,000 hours.
 - 3. The shop drawing shall include photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing and Calculation Guides, of each lighting fixture type. The adjustment factors shall be for fixtures identical to those required for this project.
 - 4. The shop drawing shall include, for each fixture, the rated driver current, indicating compliance with a maximum value of 2 mA.
 - 5. The shop drawing shall indicate the minimum delivered lumens indicating compliance with the minimum value listed in the light fixture schedule.
 - 6. The shop drawing shall indicate the CRI = Color Rendering Index of the light fixture indicating compliance with the CRI value listed in the light fixture schedule.
 - 7. Shop drawings that do not include each of the above light fixture

ratings shall be rejected.

- B. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Lighting fixtures.
 - 2. Suspended ceiling components.
 - 3. Structural members to which suspension systems for lighting fixtures will be attached.
 - 4. Other items in finished ceiling including the following:
 - a. Air outlets and inlets.
 - b. Speakers.
 - c. Sprinklers.
 - d. Smoke and fire detectors.
 - e. Occupancy sensors.
 - f. Access panels.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.
- E. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.6 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.
- B. The light fixture catalog number indicated on the project documents is to establish the intent of design but does not necessarily include all required accessories and hardware for a complete installation. Prior to shop drawing submission and fixture purchase, coordinate the final requirements for each light fixture with: ceiling construction; and finish types as required by the Professional and/or the Institution. Coordination to include but not be limited to: ceiling type; supporting methods & hardware; trim; accessories; fixture finish and color. Submission of bid indicates inclusion of all material and installation as required by these coordination requirements.

1.7 WARRANTY

- A. LED light fixtures provided as a part of this project shall be provided with a 5 year warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
 - 2. Basis-of-Design Product: The design for each lighting fixture is based on the product named in the Lighting Fixture Schedule shown on drawings. Subject to compliance with requirements, provide either the named product, a comparable product by one of the other manufacturers specified, or an approved equal.

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Metal Parts: Free of burrs and sharp corners and edges.
- C. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit re-lamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during re-lamping and when secured in operating position.
- E. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
 - 4. Laminated Silver Metallized Film: 90 percent.
- F. Plastic Diffusers, Covers, and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

- a. Lens Thickness: At least 0.125 inch minimum unless different thickness is indicated.
 - b. UV stabilized.
2. Glass: Annealed crystal glass, unless otherwise indicated.

2.3 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- B. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- C. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

2.4 REQUIREMENTS FOR INDIVIDUAL LIGHTING FIXTURES

- A. Fixtures Characteristics: As shown on Lighting Fixture Schedule.

2.5 LED LIGHT FIXTURES

- A. LED light fixtures provided as a part of this project shall have a minimum L70 rated life of 50,000 hours. The shop drawing submitted for these fixtures shall include this information.
- B. The maximum driver current for each fixture shall not exceed 2mA.
- C. The power factor of the load for each light fixture shall not exceed a value to cause a 60% loaded 277V light fixture branch circuit to have a power factor less than 0.85.
- D. The LED fixtures shall be provided with the special warranty listed in this specification.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

- B. Support for Lighting Fixtures in or on Grid-Type Suspended Ceilings: Use grid as the primary support element.
 - 1. Install a minimum of four ceiling support system rods or wires for each fixture from the building structure to tabs on the light fixture located not more than 6 inches from the light fixture corner. The wire or rod shall have a breaking strength of the weight of the fixture at a safety factor of 3.
 - 2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
 - 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

- C. Suspended Lighting Fixture Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 - 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.

- D. Adjust aimable lighting fixtures to provide required light intensities.

3.2 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 265119

SECTION 284621 - FIRE ALARM SYSTEM MODIFICATONS

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 requirements for modifications and additions to the existing fire alarm systems at the Galloway Arthur School. See drawings for information about the existing fire alarm system, contact information for the company who maintains the existing system, and a description of the scope of fire alarm system changes.
- B. The Contractor shall contact the manufacturer, maintainer, and Owner of the existing fire alarm system and provide all required equipment, labor, material, wiring, and hardware to modify the existing fire alarm system as shown on the drawings to provide a fully functional fire alarm system after the removals and additions have been completed.

1.3 DEFINITIONS

- A. FACP: Fire alarm control panel.
- B. LED: Light-emitting diode.
- C. NICET: National Institute for Certification in Engineering Technologies.
- D. Definitions in NFPA 72 apply to fire alarm terms used in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 72 regarding the requirements for submittals, removals, new installations, and testing.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire alarm system design.
 - b. Fire alarm certified by NICET, minimum Level III.

2. Every sheet of the fire alarm shop drawings, including the floor plans and wiring diagrams shall be signed and sealed by a qualified Professional Engineer who is responsible for their preparation.
 3. In addition to distribution requirements for submittals specified in applicable Division 01 Sections, submit a copy of the Shop Drawings to Authorities Having Jurisdiction.
 4. System Operation Description: Detailed description for this Project, including method of operation and supervision of each type of circuit and sequence of operations for manually and automatically initiated system inputs and outputs. Manufacturer's standard descriptions for generic systems are not acceptable.
 5. Device Address List: Coordinate with final system programming.
 6. Wiring Diagrams: Power, signal, and control wiring. Include diagrams for equipment and for system with all terminals and interconnections identified. Show wiring color code.
 7. Floor Plans: Indicate all final outlet locations showing address of each addressable device. Show size and route of cable and conduits.
 8. Battery Calculations: Provide detailed battery calculations for the existing and new batteries and new and modified circuits indicating the final new or modified battery load, types of devices connected to each alarm indicating circuit, the individual ampere load for each of the types of devices on each circuit, the number of each type of device on each circuit, the no load ampere load for each circuit, the 24 hour no load amp hour load for each circuit, the total amp hours for the 24 hour no load period and 5 minute alarm indicating period, and the amp hours of battery capacity provided for each circuit.
- C. Qualification Data: For Installer.
- D. Field quality-control test reports.
- E. Operation and Maintenance Data: For fire alarm system to include in emergency, operation, and maintenance manuals. Comply with NFPA 72, Appendix A, recommendations for Owner's manual. Include abbreviated operating instructions for mounting at the FACP.
- F. Submittals to Authorities Having Jurisdiction: In addition to distribution requirements for submittals specified in applicable Division 01 Sections, make an identical submittal to Authorities Having Jurisdiction. To facilitate review, include copies of annotated Contract Drawings as needed to depict component locations. Resubmit if required to make clarifications or revisions to obtain approval. On receipt of comments from Authorities Having Jurisdiction, submit them to Architect for review.
- G. Documentation:
1. Approval and Acceptance: Provide the "Record of Completion" form according to NFPA 72 to the Engineer and to the Owner.
 2. Record of Completion Documents: Provide the "Permanent Records" according to NFPA 72 to Owner and Authorities Having Jurisdiction. Format of the written sequence of operation shall be the optional input/output matrix.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel certified by NICET as Fire Alarm Level III.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Fire Alarm Service: Do not interrupt fire alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
 - 1. Notify Owner no fewer than five days in advance of proposed interruption of fire alarm service.
 - 2. Do not proceed with interruption of fire alarm service without Owner's written permission.

1.8 SEQUENCING AND SCHEDULING

- A. Existing Fire Alarm Equipment: Maintain fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service and label existing fire alarm equipment "NOT IN SERVICE" until removed from the building.
- B. Equipment Removal: After acceptance of the new fire alarm system, remove existing disconnected fire alarm equipment.

PART 2 - PRODUCTS

2.1 WORK AT THE FIRE ALARM CONTROLS PANELS

- A. General Description:
 - 1. Provide all required equipment, labor, wiring, and material at the main fire alarm control panel as required to accommodate the required additions and removals to the existing fire alarm system.
- B. Circuits:
 - 1. Signaling Line Circuits: NFPA 72, Class B, Style 4.
 - a. System Layout: The number of addressable devices connected to each signaling line circuit does not exceed 75% circuit capacity.
 - 2. Notification-Appliance Circuits: NFPA 72, Class B, Style Y.
 - 3. Actuation of alarm notification appliances, annunciation, and elevator recall shall occur within 10 seconds after the activation of an initiating device.
 - 4. Electrical monitoring for the integrity of wiring external to the FACP for mechanical equipment shutdown and magnetic door-holding circuits is not

required, provided a break in the circuit will cause doors to close and mechanical equipment to shut down.

- C. Notification-Appliance Circuit: Operation shall sound in a temporal pattern, complying with ANSI S3.41.
- D. Power Supply for Supervision Equipment: Supply for audible and visual equipment for supervision of the ac power shall be from a dedicated dc power supply, and power for the dc component shall be from the ac supply.
- E. Alarm Silencing, Trouble, and Supervisory Alarm Reset: Manual reset at the FACP after initiating devices are restored to normal.
 - 1. Silencing-switch operation halts alarm operation of notification appliances and activates an "alarm silence" light. Display of identity of the alarm zone or device is retained.
 - 2. Subsequent alarm signals from other devices or zones reactivate notification appliances until silencing switch is operated again.
 - 3. When alarm-initiating devices return to normal and system reset switch is operated, notification appliances operate again until alarm silence switch is reset.
- F. Walk Test: A test mode to allow one person to test alarm and supervisory features of initiating devices. Enabling of this mode shall require the entry of a password. The FACP and annunciators shall display a test indication while the test is underway. If testing ceases while in walk-test mode, after a preset delay, the system shall automatically return to normal.
- G. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, trouble, and supervisory signals to a remote alarm station through a digital alarm communicator transmitter and telephone lines.
- H. Service Modem: Ports shall be RS-232 for system printer and for connection to a dial-in terminal unit.
 - 1. The dial-in port shall allow remote access to the FACP for programming changes and system diagnostic routines. Access by a remote terminal shall be by encrypted password algorithm.
- I. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble), and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including the same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.
- J. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signal, supervisory and digital alarm communicator transmitter shall be powered by the 24-V dc source.
 - 1. The alarm current draw of the entire fire alarm system shall not exceed 80 percent of the power-supply module rating.
 - 2. Power supply shall have a dedicated fused safety switch for this connection at the

service entrance equipment. Paint the switch box red and identify it with "FIRE ALARM SYSTEM POWER."

- K. Secondary Power: 24-V dc supply system with batteries and automatic battery charger and an automatic transfer switch.
 - 1. Batteries: Sealed, valve-regulated, recombinant lead acid.
 - 2. Battery and Charger Capacity: Comply with NFPA 72.
- L. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.2 WIRE AND CABLE

- A. Wire and cable for fire alarm systems shall be UL listed and labeled as complying with NFPA 70, Article 760.
- B. Fire Alarm Circuits: Wires in metallic raceway. Red colored exterior metal jacket, UL listed for fire alarm and cable tray installation, plenum rated, MC cable may be used for concealed wiring in lieu of wires in conduit where allowed by local and national codes. In unconcealed locations in occupied spaces, provide wiring in surface mounted metal raceway that is painted to match the wall or ceiling.
- C. Non-Power-Limited Circuits: Solid-copper conductors in raceway with 600-V rated, 75 deg C, color-coded insulation.
 - 1. Low-Voltage Circuits: No. 16 AWG, minimum.
 - 2. Line-Voltage Circuits: No. 12 AWG, minimum.
 - 3. Multiconductor Armored Cable: NFPA 70 Type MC, copper conductors, TFN/THHN conductor insulation, copper drain wire, copper armor with outer jacket with red identifier stripe, UL listed for fire alarm and cable tray installation.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Smoke or Heat Detector Spacing:
 - 1. Smooth ceiling spacing shall not exceed 30 feet.
 - 2. Spacing of heat detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas, shall be determined according to Appendix A in NFPA 72.
 - 3. Spacing of heat detectors shall be determined based on guidelines and recommendations in NFPA 72.
- B. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.
- C. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so

they extend the full width of the duct.

- D. Remote Status and Alarm Indicators: Install near each duct detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.
- E. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install horns on flush-mounted back boxes.
- F. Visible Alarm-Indicating Devices: Install with bottom of the lens 80 inches above the finished floor or 6 inches below the ceiling, whichever is lower.
- G. Device Location-Indicating Lights: Locate in public space near the device they monitor.
- H. FACP: Surface mount with tops of cabinets not more than 72 inches above the finished floor.
- I. Annunciator: Install with top of panel not more than 72 inches above the finished floor.

3.2 WIRING INSTALLATION

- A. Install wiring according to the following:
 - 1. NECA 1.
 - 2. TIA/EIA 568-A.
- B. Wiring Method:
 - 1. Copper, solid insulated wire installed in metallic conduit; red MC cable with dedicated ground wire, UL listed for use in fire alarm systems may be used in concealed spaces.
 - 2. Cables and raceways used for fire alarm circuits, and equipment control wiring associated with the fire alarm system, may not contain any other wire or cable.
 - 3. Signaling Line Circuits: Power-limited fire alarm cables may be installed in the same cable or raceway as signaling line circuits.
- C. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- D. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.
- E. Color-Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and a different color-code for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm

system junction boxes and covers red.

- F. Wiring to Remote Alarm Transmitting Device: 1-inch conduit between the FACP and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals according to Specification "Basic Electrical Materials and Methods."
- B. Install instructions frame in a location visible from the FACP.
- C. Paint power-supply disconnect switch red and label "FIRE ALARM."

3.4 GROUNDING

- A. Ground the FACP and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to the FACP.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:
 - 1. Before requesting final approval of the installation, submit a written statement using the form for Record of Completion shown in NFPA 72.
 - 2. Perform each electrical test and visual and mechanical inspection listed in NFPA 72. Certify compliance with test parameters. All tests shall be conducted under the direct supervision of a NICET technician certified under the Fire Alarm Systems program at Level III.
 - 3. Visual Inspection: Conduct a visual inspection before any testing. Use as-built drawings and system documentation for the inspection. Identify improperly located, damaged, or nonfunctional equipment, and correct before beginning tests.
 - 4. Testing: Follow procedure and record results complying with requirements in NFPA 72.
 - 5. Test and Inspection Records: Prepare according to NFPA 72, including demonstration of sequences of operation by using the matrix-style form in Appendix A in NFPA 70.

3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project outside normal occupancy hours for this purpose.

- B. Follow-Up Tests and Inspections: After date of Substantial Completion, test the fire alarm system complying with testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for three monthly, and one quarterly, periods.
- C. Semiannual Test and Inspection: Six months after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- D. Annual Test and Inspection: One year after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly, semiannual, and annual periods. Use forms developed for initial tests and inspections.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the fire alarm system, appliances, and devices.

END OF SECTION 284621