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# DISTRICT MAINTENANCE & OPERATIONS BUILDING

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



**FVHD PROJECT #5195 / NJDOE# 1690-X01-20-1000**

**Consulting Engineers:**  
**Edwards Engineering Group**  
**Harrison - Hamnett, P.C.**  
**Gillan & Hartmann, Inc.**

**April 15, 2020**

**VOLUME 1 OF 2**

## **SPECIFICATIONS**

for

### **MAINTENANCE & OPERATIONS BUILDING**

103 South Reeds Road, Galloway, NJ 08205

for the

### **GALLOWAY TOWNSHIP SCHOOL DISTRICT**

GALLOWAY TOWNSHIP, ATLANTIC COUNTY, NEW JERSEY

**FVHD PROJECT #5195 / NJDOE# 1690-X01-20-1000**

#### **FRAYTAK VEISZ HOPKINS DUTHIE, P.C.**

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#### **HARRISON - HAMNETT, PC**

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40 Knowles Street

Pennington, NJ 08534

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#### **GILLAN & HARTMANN, INC.**

##### **Consulting Engineers**

140 Whitaker Avenue, Suite 300

Mont Clare, PA 19453

Michael S. Gillan, P.E., No. 24GE4470000

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**ADVERTISEMENT FOR BIDS**  
**Galloway Township Board of Education**  
**Atlantic County, New Jersey**

NOTICE IS HEREBY GIVEN that the Galloway Township Board of Education will accept bids for **New District Maintenance & Operations Building**, 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 #5195**.

Sealed Bids will be received for: Single Overall Contract  
(C008 or C009 with C029, C030, C032, C047)

Sealed Bids are due by **Wednesday, August 12, 2020, 2:00 PM**, to the Galloway Township Board of Education, 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. **Bids will be opened outside of the school building, facial coverings and social distancing, will be required.**

Prebid Meeting is scheduled for **Thursday, July 23, 2020, 3:00 PM**, at Reeds Road ES main entrance, 101 South Reeds Road, Galloway, NJ 08205. Attendance at the prebid 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, and may be obtained by prospective bidders electronically via direct download (pdf format), electronic file on disc, or printed paper set. Information about the Project can be found on our website: [www.fvhdp.com](http://www.fvhdp.com) under CONTRACTOR, BID LISTING. Downloadable Electronic Bid Documents are available without fee. Bid Documents by disk will be available for a non-refundable fee of \$25, or by paper set for a non-refundable deposit of \$500.00 for each paper set. Checks for disks and paper sets are 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. Bidders should only rely on original digital and paper versions of the bidding contract documents obtained directly from the Architect's office. Any bidder should contact the Architect's office at (609) 883-7101 to confirm availability of documents. To obtain bid documents, please download and fill out the "Bidder Registration Form," available at <https://fvhdpc.com/bids/bidlisting>, and fax or email the completed form to the Architect's Office. Upon receipt of the form, electronic bid documents will be made available for download with an emailed link that will have an expiration date. If disk or paper sets are requested, mail the required payment by check, to the Architect's Office. Upon receipt of payment, disk or paper sets will be shipped, or made available for pick-up. **All requests for information (RFI) must be submitted by 2:30 PM on August 1, 2020, and sent via facsimile at (609) 883-2694 or via common carrier to the Architect with the Architect Project Name and Project Number referenced. RFI request submitted to the Architect via E-mail will not be accepted or responded to.**

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 in the amount of 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 shall 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.

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., 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 N.J.S.A. 10:5-31 et seq., N.J.A.C. 17:27 et seq. and N.J.S.A. 10:2-1. 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, Business Administrator/Board Secretary

## **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 those specifically set forth in the Contract Documents.
- 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. Site visit(s) can be arranged only upon request, subject to COVID-19 restrictions. Requests for a site visit(s) shall be made to the architect ([thopkins@fvhdpc.com](mailto:thopkins@fvhdpc.com) and [info@fvhdpc.com](mailto:info@fvhdpc.com)).**
  - 2. 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 Registered Roof Observer (RRO) or Registered Roof Consultant (RRC) Firm.**

- 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.

1. **Refer to paragraph 1.1, D.1 above for information pertaining to arranging site visit(s), subject to COVID-19 restrictions.**

- 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) business 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 shall be cause for rejection 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., 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 TOTAL AMOUNT OF UNCOMPLETED CONTRACTS**

- A. Uncompleted Contracts (For Contracts Exceeding \$20,000) (N.J.A.C. 17:19-2.13(a))
  1. The Board requires that each bidder submit with his/her bid, a certified Total Amount of Uncompleted Contracts form as prescribed by the cited regulation. (Form DPMC 701). Failure to submit this document will lead to having the bid being rejected as non-responsive.

## **1.7 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.fvhdpc.com/bids/bidlisting.aspx](http://www.fvhdpc.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

Jason Dubowitch, AIA, NCARB, Senior Associate

1515 Lower Ferry Rd, Trenton, NJ 08618

Electronic Facsimile (609) 883-2694

**FVHD Project No. 5195**

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.

**1.8 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. **Bidders submitting a Bid for more than one contract shall submit their Bids in separate sealed envelopes.**
- 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.

## **1.9 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 1.10.
  3. **For Bidders who are submitting multiple Bids for a project, the Bidders shall submit one Bid Bond Form for each contract Bid in the separate sealed envelopes.**
- 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 paragraph 12 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.

## **1.10 CONTRACT BONDS**

- A. 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 Bidder with both a 1) Performance Bond and a 2) Payment Bond, in form as bound herein; each bond in the amount of 100% of the bid amount. Also the surety agrees to furnish the Bidder with a 3) 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 with 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](http://www.nj.gov/dobi/surety.htm)).
- B. The Bidder to whom the Contract has been awarded shall, within ten (10) calendar days after Notice of Award of contract to the Bidder, furnish and deliver both a 1) Performance Bond and 2) Payment Bond, in form as bound herein, each bond in the amount of one hundred percent (100%) of the bid amount.
  1. If, at any time after execution and approval of a Contract and both the 1) Performance Bond and the 2) Payment Bond required by Contract Documents, such Bonds shall cease to be adequate security for the Owner, the Contractor shall, within five (5) business days after notice to do so, furnish a new or additional Bonds, 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 Bonds shall be furnished and approved.
- C. 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.
- D. The cost of all Bonds shall be paid for by the Contractor and shall be included as a part of Contractor's bid price.

#### **1.11 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.

#### **1.12 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.

#### **1.13 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.

## 1.14 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 results 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 Public 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) calendar days of the notification of the award to him/her, Sundays and holidays excepted, after making the award.
- G. Upon award of the Contract, the General Contractor shall execute and return to the Owner the "Contractor Certification and Consent Upon Award of Contract," attached to the Contract as an Exhibit.

#### **1.15 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.

## **1.16 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.

## **1.17 TIME OF COMPLETION AND LIQUIDATED DAMAGES**

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

## **1.18 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.

#### **1.19 NON-COLLUSION AFFIDAVIT**

- A. The bidder shall submit the Non-Collusion Affidavit, on form as bound herein, must be submitted with the bid. Failure to submit this document will lead to having the bid being rejected as non-responsive.

#### **1.20 EQUIPMENT CERTIFICATION**

- A. Bidders shall submit with their bids a certificate showing that same owns, leases, or controls all the necessary equipment required by plans and specifications. If the bidder is not the actual owner or lessee of any such equipment, it shall submit a certificate stating the source from which the equipment will be obtained and shall obtain a certificate from the owner and person in control of the equipment, granting to the bidder the control of the equipment required during such time as may be necessary for the completion of that portion of the contract for which it is necessary.
- B. The included Equipment Certification form shall be completed and attached to the bid proposal.

#### **1.21 DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN**

- A. Pursuant to N.J.S.A. 18A:18A-49.4, a board of education is required to implement and comply with the provisions of P.L. 2012, C. 25. This law requires a bidder to certify, at the time the bid is submitted, that the bidder is not identified on the State Department of Treasury's list of persons and entities engaging in investment activities in Iran as defined by N.J.S.A. 52:32-56 or to disclose the investment activities in Iran in which the bidder or one of its parents, subsidiaries, or affiliates has engaged. Accordingly, the bidder shall submit with its bid the accompanying Certification of Disclosure of Investment Activities In Iran. Submission of a false certification subjects the bidder to the penalties provided in N.J.S.A. 18A:49.4 and 52:32-59.

#### **1.22 POLITICAL CONTRIBUTION DISCLOSURE**

- A. Pursuant to N.J.A.C. 6A:23A-6.3 bidders shall provide a list of political contributions on the attached forms with their bids. The Board may not award a contract over \$17,500.00 to a bidder that has made a reportable contribution to a member of the district board of education during the preceding one year period.

## 1.23 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, 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:27-11 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.
  3. Bidder should consult the statutes such as N.J.S.A. 18A:7G-39 or legal counsel for further information.

## 1.24 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**

**C008 - General Construction**

Or

**C009 - General Construction/Alterations and Additions**

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

#### **Subcontractors:**

**C029 - Structural Steel and Ornamental Iron**

**C030 - Plumbing**

**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 OF TEN PERCENT (10%) OF THE TOTAL AMOUNT OF BID, NOT TO EXCEED \$20,000 (TWENTY THOUSAND DOLLARS) (with Power of Attorney)
- (\*) PROPOSITION OF SURETY FOR 100% OF THE CONTRACT AMOUNT (with Power of Attorney)
- (\*) SUBCONTRACTOR IDENTIFICATION STATEMENT
- (\*) OWNERSHIP DISCLOSURE CERTIFICATION
- (\*) DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN
- (\*) NON COLLUSION AFFIDAVIT
- (\*) CERTIFICATION OF NO MATERIAL CHANGE OF CIRCUMSTANCES - CONTRACTOR
- (\*) CERTIFICATION OF NO MATERIAL CHANGE OF CIRCUMSTANCES - SUBCONTRACTOR
- (\*) 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) ENCOURAGED TO SUBMIT WITH BID BUT REQUIRED PRIOR TO CONTRACT AWARD
- BUSINESS REGISTRATION CERTIFICATE - ALL CONTRACTOR(S) AND SUBCONTRACTOR(S) ENCOURAGED TO SUBMIT WITH BID BUT REQUIRED PRIOR TO CONTRACT AWARD
- (\*) DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION (DPMC) FORM 701 - TOTAL AMOUNT OF UNCOMPLETED CONTRACTS, N.J.S.A. 34:11-56.48 ET SEQ. - ALL CONTRACTOR(S) AND SUBCONTRACTOR(S)
- (\*) DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION (DPMC) CURRENT NOTICE OF CLASSIFICATION/PRE-QUALIFICATION CERTIFICATE(S) - ALL CONTRACTOR(S) AND SUBCONTRACTOR(S)
- (\*) CONTRACTOR CERTIFICATION; QUALIFICATIONS AND CREDENTIALS
- (\*) AMERICANS WITH DISABILITY ACT 1990



**BIDDER'S CHECKLIST**

- (\*) EQUIPMENT CERTIFICATION
- (\*) EXHIBIT B - MANDATORY EQUAL EMPLOYMENT OPPORTUNITY
- STATUS OF PRESENT CONTRACTS
- TRADE LICENSE
- HVACR MASTER LICENSE (HVACR CONTRACTORS)
- 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 PROPOSITION 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.**

Proposition 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.

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.

BIDDER \_\_\_\_\_

**STATEMENT OF OWNERSHIP DISCLOSURE**

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

**This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.**

Name of Organization: \_\_\_\_\_

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

City, State, ZIP: \_\_\_\_\_

**Part I Check the box that represents the type of business organization:**

- Sole Proprietorship
- Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- For-Profit Corporation (any type)       Limited Liability Company (LLC)
- Partnership       Limited Partnership       Limited Liability Partnership (LLP)
- Other (be specific): \_\_\_\_\_

**Part II Check the appropriate box**

- The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**
- OR**
- No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Address (for Individuals) or Business Address

**Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II**

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

**Please list** the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above.** The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Address (for Individuals) or Business Address

**Part IV Certification**

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the \_\_\_\_\_ **Board of Education** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with the **Board of Education** to notify the **Board of Education** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the **Board of Education** to declare any contract(s) resulting from this certification void and unenforceable.

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

**This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.**

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

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

\*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.

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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 (N.J.S.A. 34:11-56.25 et seq.)**

Every contractor and subcontractor performing services in connection with this project, shall pay all workers a wage rate not less than the published prevailing wage rates, for the locality the work is being performed, as designated by the New Jersey Department of Labor and Workforce Development (NJ DLWD).

Wage rates for the county of the location of the school district, as published by the State Department of Labor and Workforce Development (DLWD), can be viewed at [https://www.nj.gov/labor/wagehour/wagerate/prevailing\\_wage\\_determinations.html](https://www.nj.gov/labor/wagehour/wagerate/prevailing_wage_determinations.html)

The contractor must complete and sign the "Prevailing Wage Certification" form included in the bid package and submit with his bid. This form confirms the contractor's intention to comply with the act. The Board may terminate the contract if contractor fails to pay workers prevailing wage.

The prevailing wage rates in affect at the time of award, will be included as a part of the construction contract.

## PREVAILING WAGES COMPLIANCE CERTIFICATION

It is the determination of the Board of Education that this is a public works project that in total will exceed \$2,000.00 (two thousand dollars), therefore prevailing wages rules and regulations apply as promulgated by the New Jersey Prevailing Wage Act and in conformance with N.J.S.A. 34:11-56:25 et seq.

### **Certification**

1. I certify that our company understands that this project of the Board of Education 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 subcontractor to pay prevailing wages in full accordance with the law.

### **Non-compliance Statement**

If it is found that any worker, employed by the contractor or any subcontractor covered by said contract, has been paid a rate of wages less than the prevailing wage required to be paid by such contract, the Board of Education, may begin proceedings to terminate the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise. The contractor and his sureties shall be liable for any excess costs occasioned thereby to the public body.

### **NOTIFICATION OF VIOLATIONS – New Jersey Department of Labor and Workforce Development**

Has the bidder or any person having an "interest" with the bidder, been notified by the New Jersey Department of Labor and Workforce Development by notice issued pursuant to N.J.S.A. 34:11-56a et seq that he/she has been in violation for failure to pay prevailing wages as required by the New Jersey Prevailing Wage Act within the last five (5) years?

\*Yes \_\_\_\_\_

No \_\_\_\_\_

\*If yes, please attach a signed document explaining any/or all administrative proceedings with the Department within the last five (5) years. Please include any pending administrative proceedings with the Department if any.

### **Submission of Certified Payroll Records**

All certified payroll records are to be submitted to the Owner, Business Administrator, who is coordinating the activities for the project:

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

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
			\$

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. \_\_\_\_\_

Bid Date: \_\_\_\_\_  
(Weekday, Month 00, 20\_\_)

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** \_\_\_\_\_

## Sworn Contractor Certification; Qualifications and Credentials

Pursuant to N.J.S.A. 18A:7G-37, a pre-qualified contractor seeking to bid school facilities projects, and any subcontractors, that are required to be named under N.J.S.A. 18A:7G-1 et seq. shall, as a condition of bidding, submit this Sworn Contractor Certification regarding qualifications and credentials.

I, \_\_\_\_\_, the principal owner or officer of the Bidder (or, the "Company"), certify that the forging statements are true and the firm has the following qualifications and credentials:

1. A current, valid certificate of registration issued pursuant to "The Public Works Contractor Registration Act," N.J.S.A. 34:11-56:48 et seq., a copy of which is submitted with this bid;
2. If a corporation or LLC formed under the laws of a state other than New Jersey, a current, valid "Certificate of Authority to perform work in New Jersey", a copy of which is submitted with this bid;
3. A current, valid, contractor or trade license required under applicable New Jersey Law for any specialty trade or specialty area in which the firm seeks to perform work, a copy of which is submitted with this bid;

I further certify that, during the term of the school facilities project, the Company will have in place a suitable quality control and quality assurance program and an appropriate safety and health plan.

I further certify that, at the time of bidding, the amount of the bid proposal and value of all of its outstanding incomplete contracts does not exceed the Company's existing aggregate rating limit.

Name of Company \_\_\_\_\_

Name of Owner or Officer \_\_\_\_\_

**Signature of Owner or Officer** \_\_\_\_\_

Notarized before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_  
Month Year

\_\_\_\_\_  
**NOTARY PUBLIC SIGNATURE**

\_\_\_\_\_  
**Print Name of Notary Public**

My commission expires \_\_\_\_\_, \_\_\_\_\_  
Month Day Year

**-SEAL-**

***To be completed, signed, notarized and returned with bid.***

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.

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

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

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

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

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B, and C, as long as the Dept. of LWD, construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

- (A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et seq., as supplemented and amended from time to time and the American 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.

EXHIBIT B (Continued)

- (B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:
- 1) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;
  - 2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;
  - 3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;
  - 4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;
  - 5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and nondiscrimination 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 upon request.
- (C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which

EXHIBIT B (Continued)

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 ration 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.

(Revised: January, 2016)

Reviewed By: \_\_\_\_\_

Title: \_\_\_\_\_

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

Date: \_\_\_\_\_

Signature: \_\_\_\_\_



**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 N.J.S.A.17:17-6 or N.J.S.A. 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 N.J.S.A. 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 NJSA 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)

# 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.

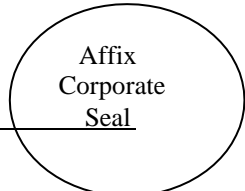
Now, if the said Principal shall well and faithfully do and perform each and every, all and singular, the things agreed by it (or them) to be done and performed according to the terms of said contract, and shall pay all lawful claims of beneficiaries as defined by N.J.S.2A:44-143 for labor performed 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:**

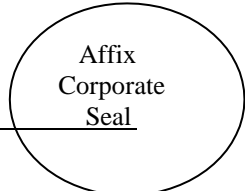
By: \_\_\_\_\_  
Print Name:  
Print Title:



\_\_\_\_\_  
Witness  
\_\_\_\_\_  
Print or Type Name

**Surety:**

By: \_\_\_\_\_  
Print Name:  
Print Title:



\_\_\_\_\_  
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.

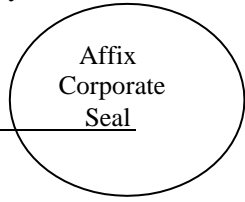
The said Surety hereby stipulated and agrees that no modifications, omissions or additions in or to the terms of the said contract, or in or to the plans or specifications therefore, shall in anyway affect the obligations of said Surety on its bond.

**Principal:**

By: \_\_\_\_\_

Print Name:

Print Title:



\_\_\_\_\_  
Witness

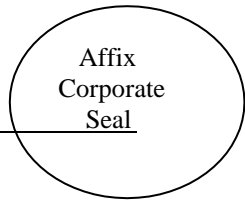
\_\_\_\_\_  
Print or Type Name

**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](http://www.state.nj.us/treasury/contract_compliance/pdf/aa201ins.pdf)

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

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](http://www.state.nj.us/treasury/contract_compliance/pdf/aa202ins.pdf)

1. Name and address of Prime Contractor  (NAME)  (ADDRESS)  (CITY) (STATE) (ZIP CODE)		2. Contractor ID Number	3. F ID or SS Number
4. Reporting Period		5. Public Agency Awarding Contract  Date of Award	
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	CLASSIFICATION (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 MIN. W/H	% OF FEMALE W/H	WORK HOURS	MIN. HOURS	FEMALE HOURS	% OF MIN. W/H	% OF FEM. W/H
			J																	
			AP																	
			J																	
			AP																	
			J																	
			AP																	
			J																	
			AP																	

17. COMPLETED BY (PRINT OR TYPE)

(NAME) (SIGNATURE) (TITLE)

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



# AIA<sup>®</sup> Document A101<sup>®</sup> – 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)*

Galloway Township Public Schools  
101 South Reeds Road  
Galloway, NJ 08205

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.

### **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.

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.

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/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.

*(Paragraph deleted)*

§

§ 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:

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

Init.

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.)*

## 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 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.)*

Two percent (2%) of the amount due on each partial payment shall be withheld when the outstanding balance of the contract exceeds \$500,000, and five percent (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.)*

Five percent (5%) of the amount due on each partial payment shall be retained 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.

§ 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.)*

**§ 6.2 Binding Dispute Resolution**

For any Claim, 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 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)*

*(Paragraphs deleted)*

**§ 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

*(Paragraphs deleted)*

- .5 Drawings

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

- .6 Specifications

Section	Title	Date	Pages
00800	Supplementary General Conditions		
00850	Contract Drawings		
00860	Laws Governing Public Work		
00870	Miscellaneous Requirements		
01010	Summary of Work		
01020	Allowances		
01030	Alternate Bids		
01040	Coordination		
01050	Alterations, Cutting, Patching and Refinishing Work		
01151	Unit Prices		

01200	Project Meetings
01400	Material Testing/Quality Control Services
01410	References and Industry Standards
01505	Temporary Facilities
01524	Construction Waste Management
01600	Product Requirements
01700	Project Closeout Documents and Procedures
01800	Time of Completion and Liquidated Damages
01900	Guarantees and Warranties
01950	Subsoil Data/Soil and Foundation Engineering Report

**.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
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**.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.

\_\_\_\_\_  
**OWNER** *(Signature)*

\_\_\_\_\_  
**CONTRACTOR** *(Signature)*

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
*(Printed name and title)*

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**AIA**<sup>®</sup>

# Document A101<sup>™</sup> – 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<sup>™</sup>-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<sup>™</sup>-2017, General Conditions of the Contract for Construction. Article 11 of A201<sup>™</sup>-2017 contains additional insurance provisions.

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**§ 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,

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 three million dollars (\$ 3,000,000.00 ) each occurrence, three million dollars (\$ 3,000,000.00 ) general aggregate, and three million dollars (\$ 3,000,000.00 ) 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

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User Notes:

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- .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.)*

**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:

Init.



**PART 1 - CONTRACT CONDITIONS AND GENERAL REQUIREMENTS**



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



# AIA<sup>®</sup> Document A201<sup>®</sup> – 2017

## General Conditions of the Contract for Construction

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

**THE OWNER:**  
(Name, and address)

Galloway Township Public Schools  
101 South Reeds Road, Galloway, NJ 08205

**THE ARCHITECT:**  
(Name, and address)

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

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- 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
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- 13 MISCELLANEOUS PROVISIONS
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- 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<sup>™</sup>, 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 Contractor is strongly encouraged 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)*

#### §

§ 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 (30) 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 interpreted 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.

*(Paragraphs Deleted)*

**§ 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 Owner does not waive Claims 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.

*(Paragraphs Deleted)*

**§ 15.4 Arbitration**

§ 15.4.1 All questions in dispute between the Owner and the Contractor shall be determined by the Courts having jurisdiction

*(Paragraphs Deleted)*

of the subject matter, and neither party shall submit to arbitration by the American Arbitration Association or any other arbitration agency.



*Galloway Township Public Schools*  
*"Where Children and Learning Come First"*

101 South Reeds Road | Galloway, NJ 08205  
Phone: (609) 748-1250 | Web: <http://www.gtps.k12.nj.us>

Annette C. Giaquinto, Ed. D.  
Superintendent of Schools

Joy N. Nixon, CPA  
School Business Administrator

A resolution was made by Mr. Gentile, and seconded by Dr. Beshara-Blauth, carried by a roll call vote, to accept the Superintendent's recommendation to approve the following:

Resolution of the Galloway Township Public School District authorizing the naming of a brand name product in the specification for the ATC replacements.

**WHEREAS**, the Galloway Township School District ("Board) has determined to undertake a project consisting of ATC Replacements & Hardware Replacements hereinafter collectively referred to as "the Project.");

**And**

**WHEREAS**, based upon the advice and recommendation of its design professionals, the Board determined that it is in its best interests to require the use of brand name products for these replacements, modification and upgrades; and

**WHEREAS**, the specifications for the Project identify ATC equipment manufactured by Honeywell as the only acceptable product for these replacements, modification and/or upgrades; and Best Locks as the only acceptable product for hardware replacements.

The ATC system scope of work at the Storage Building is to use the same ATC system to eliminate the current antiquated/obsolete systems. The Board has determined that the specification of the ATC systems for Storage Building will simplify the service aspects, parts, inventory and facilitate repair operations. Honeywell and Best Lock systems are presently installed in other schools within the District. Existing maintenance/service/repair contracts on the existing ATC systems can be extended to cover the new installations and simplify the repair effort. Additionally, parts inventory will be reduced by not having a multitude of Manufacturers with different parts and service requirements.

**NOW, THEREFORE, BE IT RESOLVED**, that the Board authorizes the specifications for the ATC Systems Replacements to name equipment manufactured by Honeywell and the Hardware by Best Locks.

Certification of Joy N. Nixon, Business Administrator/Board Secretary: I, Joy Nixon, of full age, hereby certifies as follows:

I am the Business Administrator/Board Secretary for the Galloway Township School District

According to the project architect, the ATC Systems Replacement must be manufactured by the same company, as specified. According to the project architect, requiring the same manufacturer is necessary for the following reasons:

To simplify parts inventory, service contracts, and to facilitate repair efforts in the future. The new systems will match the existing systems installed in other school buildings within the District.

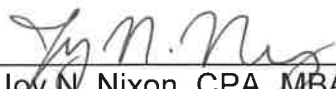
**CERTIFICATION**

I, Joy Nixon, Business Administrator/Board Secretary of the Board of Education of the Galloway Township School District in the County of Atlantic, New Jersey, DO HEREBY CERTIFY that the resolution entitled **A RESOLUTION OF THE BOARD OF EDUCATION OF THE GALLOWAY TOWNSHIP SCHOOL DISTRICT IN THE COUNTY OF ATLANTIC, NEW JERSEY**, is a copy of the resolution which was duly adopted by the Board at a meeting duly called and held on February 24, 2020, in full compliance with the Open Public Meetings Act, N.J.S.A. 10:4-6, et. seq., at which meeting a quorum was present and acting throughout and which resolution has been compared by me with the original thereof as contained in the minutes as officially recorded in my office in the Minute Book of the Board and is a true, complete and correct copy thereof and the aforesaid resolution has not been repealed, amended or rescinded but remains in full force and effect on and as of the date hereof.

Roll Call:	Mrs. Avery	Aye	Mr. Greb	Aye
	Dr. Beshara-Blauth	Aye	Mr. Knorr	Absent
	Mrs. Chester	Aye	Dr. Parmenter	Absent
	Mr. Gentile	Aye	Mr. Dase	Aye
			Mrs. Carmen	Aye

7 Ayes, 2 Absent  
Motion Carried

I, Joy N. Nixon, School Business Administrator of Galloway Township Public School District, in the County of Atlantic, State of New Jersey do hereby certify that the foregoing is a true and correct copy of a Resolution adopted by the governing body of the Galloway Township Board of Education, County of Atlantic, State of New Jersey at a regular meeting of said governing body held on February 24, 2020.

  
\_\_\_\_\_  
Joy N. Nixon, CPA, MBA  
School Business Administrator/  
Board Secretary

(SEAL)

## 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.

<b>General Construction</b>	<b>3 Sets</b>
<b>Structural &amp; Miscellaneous Steel</b>	<b>2 Sets</b>
<b>Plumbing, Drainage, Gas Fittings</b>	<b>2 Sets</b>
<b>Heating, Ventilating, Air Conditioning &amp; Refrigeration</b>	<b>2 Sets</b>
<b>Electrical</b>	<b>2 Sets</b>
<b>Single Overall Contract</b>	<b>6 Sets</b>

- 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:

3.12.10 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.

3.12.11 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.

3.12.12 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.

3.12.13 Submittals are to be provided to the Architect consistent with the sequence of the proposed Work.

3.12.14 All fabricated work shall require shop drawings.

3.12.15 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.

3.12.16 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.

#### 3.12.17 Request for Substitutions:

- .1 Pursuant to N.J.S.A. 18A:18A-15(d), requests for substitutions, for a requested approved equal product, will be reviewed for compliance with the specifications based upon the data provided by the Contractor after the award of the project. 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 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.

#### 3.12.18 Approval of Substitutions:

- .1 Requests for substitutions, for a requested approved equal product, will be reviewed for compliance with the specifications based upon the data provided by the Contractor after the award of the project. 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 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 et seq., 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.

9.6.14 Payment requisitions for asphalt paving / track paving projects must include as part of the payment requisition a survey with spot elevations from a licensed New Jersey surveyor of the base course to document that the General Contractor will be able to meet the final elevations noted for the top course. Payments will not be released without the submission of all required documents.

## **1.5 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 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](http://www.nj.gov/dobi/surety.htm)), and shall remain in effect for a period of not less than one year 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 11.6.1 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.

**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 April 15, 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:

3.6.1 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, Notices and Compliance with Laws" 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 July 21, 2017) - 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. S121.01 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 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).

## **1.9 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.



## **1.10 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.

## **1.11 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.

## **1.12 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](https://www.nj.gov/treasury/contract_compliance/documents/pdf/guidelines/pa.pdf)

## **1.13 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.

#### **1.14 ANTI-BULLYING BILL OF RIGHTS ACT (P.L. 2010.C.122)**

A. N.J.S.A. 18A:37-16 provides:

1. 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.
2. 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.

3. 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.
4. 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.

### **1.15 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](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/Each 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/all 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, 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(s) 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(s) 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/Each Prime Contractor shall provide identification cards for his/her subcontractors, employees, etc.
  - 7. The/All Contractor(s) 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. Contractor shall coordinate and cooperate with the Owner and the Architect for completing and submitting the required "APPLICATION FOR PERMIT AND CERTIFICATE" current forms (R-GP-005) to the Department of Environmental Protection.

2. Refer to Section 01700 - Project Closeout.

## **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.A.C. 12:60-5.1(c)(1)(i), 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 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.

**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 Maintenance & Operations Building for the Galloway Township Public 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-5195) and their Consulting Engineers:
  - 1. Consulting Civil Engineer: Edwards Engineering Group, Inc., Somerville, NJ.
  - 2. Consulting Structural Engineer: Harrison-Hamnett, P.C., Pennington, NJ.
  - 3. 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. All Site Work including, but not limited to the indicated access drive, parking lot, site lighting, utility services, landscaping, chain-link fencing / rolling gate and stormwater connections to the existing storm water management basins.
  - 2. New District Maintenance & Operations Building:
    - a. Administrative Office Area: Vestibule, Waiting / Secretary Office Area, Offices, Training Room, File Storage, Food Service Storage, Toilet Rooms, Janitor's Closet, and IDF.

- b. Maintenance Work Area.
  - c. Storage.
  - d. Alternate Bid(s):
    - 1) Alternate Bid No. 1: Child Care Storage Expansion.
    - 2) Alternate Bid No. 2: Air Conditioning in Maintenance Work Area #120.
  - 3. All plumbing, mechanical and electrical system work, as indicated on the drawings.
  - 4. All other indicated work.
- B. Single Overall Contract: This contract includes:
- 1. All work in accordance with drawings, Parts 2, 3, 4, 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 other Prime Contractors.
      - 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 (storm drainage, water service, and sanitary sewer), as specified in Part 2 specification sections.
        - a) **Site utility work shall be from 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.**
      - 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 metal fabrications, aluminum handrails and railings and in accordance with Division 2 Sections.
      - 6) All site lighting fixtures, poles and bases, where applicable.
      - 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.
  - 8) Furnishing stainless steel sinks, fixtures, accessories, and all items supplied by the casework and equipment subcontractor in accordance with drawings and specification sections in Division 11, for installation by the Plumbing Work Contractor.
  - 9) Furnishing all electrical devices and items supplied by the casework and equipment subcontractor in accordance with drawings and specification sections in Division 11 for installation by the Electrical Work Contractor.
3. Structural and Miscellaneous Steel Work includes:
- a. Fabrication and erection of structural steel, framing, metal deck, steel stairs, steel handrails and railings, miscellaneous structural steel in accordance with Part-3 specification sections.
4. Plumbing, Drainage and Sprinkler System Work includes:
- a. Piping servicing domestic water piping, gas piping, drainage and sprinkler systems and connection of equipment tied into the above types of systems and including all work in accordance with drawings and Part-4 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 Plumbing, Drainage and Sprinkler system work and as indicated or required including work at existing roofs; cutting, alterations, replacement and flashing work, where indicated or required.
      - 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 Work and as required by the installation of plumbing 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.
  - 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.**
5. 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 structural drawings and/or as per approved shop drawings by the Architect / Structural Engineer.
      - 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.
6. 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, 4, 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. All electric wiring and associated work for site lighting fixtures, where applicable (site lighting fixtures, poles and bases are by the General Contractor). Coordinate all work with the General Contractor.
- e. **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 may partially occupy the building 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(s) 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.
  - 4. Major subcontractors, suppliers, and fabricators.
  - 5. Others interested in the work.

### **1.8 SECURITY PROCEDURES**

- A. Limit access to the site and building 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. All Contractor(s), and their employees, 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**

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**1:01010-6**

## 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 type of allowance scheduled herein for the work includes 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 **\$40,000.00** for work not specifically shown on the drawings, the work shall be performed as directed in the field.
    - b. A sum of **\$10,000.00** for the Special Inspections of the Class 1 Building as indicated in Specification Section 01400.
  - 2. Electrical Work
    - a. Additional outlets:
      - 1) Allow a sum of money in the Base Bid for 5 additional outlets, location to be selected by the Architect. Work will include the following:
        - a) Conduit from closest panelboard, outlet box of size and type required, wire and connection to branch circuit protective device in panelboards.
        - b) An outlet shall be as defined in the National Electric Code or American Standard with the addition of a local light control switch for lighting fixtures, which shall also be defined as an outlet.
        - c) Include a unit price for one outlet, reflecting all of the above, in the proposal to be used in computing additions to or deductions from the contract price.
    - b. Moving outlets:
      - 1) The Owner, through the Architect, reserves the right to move any outlet a distance of 10 feet before roughing in without additional expense to the Owner.

**END OF SECTION 01020**

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**1:01020-2**



## 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 separate and single overall bids, and must be included in the Bidder's Proposal(s).

**1.2 ALTERNATE BIDS**

A. **Alternate Bid No. 1: Child Care Storage Expansion**

State the amount to be added to the base bid to add an additional bay of general construction work for Child Care Storage, as shown on various drawings and as indicated in various specification sections.

B. **Alternate Bid No. 2: Air Conditioning in Maintenance Work Area #120**

State the amount to be added to the base bid to provide and install unit AHU-2, the associated refrigerant piping, condensing unit piping and CU-2 and all associated work to provide air conditioning in Maintenance Work Area #120, 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 the 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 the 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.

F. Composite Drawings:

1. The HVACR Work Contractor 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 Plumbing 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 Plumbing 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 Plumbing Work Subcontractor will utilize a green colored pencil for the layout of his/her work.
  - b. After completion, the Plumbing Subcontractor will forward the mylars and two (2) prints to the Electrical Subcontractor while retaining a sepia for his/her records.
  - c. The same mailing procedures will pertain.
5. The Electrical Work Subcontractor will duplicate the procedure outlined above, utilizing orange colored pencil for his/her layout.
  - a. After completion the Electrical Subcontractor will forward the drawings as specified above to the Fire Protection Work Subcontractor, (Plumbing Work Subcontractor), if applicable, who will layout his/her work with a red pencil and, after completion, forward the drawings to the General Contractor, retaining a sepia for his/her records.
6. 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.

7. 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.
8. When all conflicts are resolved, the Subcontractors will indicate their agreement by signing these final composite drawings.
9. 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.
10. 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 and by the General Construction Work Contractor, the General Construction Work Contractor shall provide and distribute prints to each of the Subcontractors, 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.



11. 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.
12. 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.
13. 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.
14. In areas where no HVAC work occurs, but where other mechanical and electrical installations are required, each involved Subcontractor or Prime Contractor 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, the 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, plumbing, 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. Other Prime Contractor(s) / 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, (for site and building work), 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. (Sub)Contractors shall cooperate in arranging their work with other (Sub)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, wires for roof, 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. 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 NO<sub>x</sub> 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 40 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 the Division 40 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. He / She 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 Contractor.
  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 Contractor shall verify and confirm floor to floor 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/Each 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 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 new building shall be performed by the General Construction Work Contractor.
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. 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(s) fails to clean-up their debris within 24 hours, the Owner has the right to clean-up the debris left by the Contractor(s). All associated clean-up costs, incurred by the Owner, will be back-charged to the Contractor(s) who left the debris.

### **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/Each 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/Each Prime Contractor shall be responsible for providing coordination of this temporary work between Prime Contractors and 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. General excavation for buildings shall arbitrarily be assumed to extend to vertical planes 2 feet outside of the outside wall lines and to the elevation of the plan subgrade.
- E. 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.
- F. Excavation for a footing (the pad) under a wall shall be measured as the neat plan width and depth of the footing
- G. 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.
- H. 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.
- I. Excavation for sump and other pits shall be computed as vertical shafts, each with a horizontal cross section identical in shape and size with the plan of the bottom of the construction installed (out to out of pit walls).

- J. 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.
- K. 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 cu. yd.  
 and trench or pit rock excavation shall be \$ 400.00 per cu. yd.

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.  
 Bituminous Paving (including subbase) \$\_\_\_\_\_ per sq. yd.  
 Concrete Curb \$\_\_\_\_\_ per lin. ft.  
 Concrete Walk (including subbase) \$\_\_\_\_\_ per sq. ft.

**1.5 UNIT PRICES - PLUMBING & DRAINAGE: Materials in Place.**

2" sanitary and vent pipe above grade \$\_\_\_\_\_ per lin. ft.  
 3" sanitary and vent pipe above grade \$\_\_\_\_\_ per lin. ft.  
 2" sanitary and vent pipe below grade \$\_\_\_\_\_ per lin. ft.  
 4" sanitary and vent pipe below grade \$\_\_\_\_\_ per lin. ft.  
 1/2" domestic hot & recirc. water pipe above ground with insulation \$\_\_\_\_\_ per lin. ft.  
 3/4" domestic hot & recirc. water pipe above ground with insulation \$\_\_\_\_\_ per lin. ft.  
 1" domestic hot & recirc. water pipe above ground

with insulation	\$ _____ per lin. ft.
1-1/4" domestic hot & recirc. water pipe above ground with insulation	\$ _____ per lin. ft.
1/2" domestic cold water pipe above ground with insulation	\$ _____ per lin. ft.
3/4" domestic cold water pipe above ground with insulation	\$ _____ per lin. ft.
1" domestic cold water pipe above ground with insulation	\$ _____ per lin. ft.
1-1/4" domestic cold water pipe above ground with insulation	\$ _____ per lin. ft.
1-1/2" domestic cold water pipe above ground with insulation	\$ _____ per lin. ft.
2" domestic cold water pipe above ground with insulation	\$ _____ per lin. ft.
1/2" domestic cold water pipe insulation	\$ _____ per lin. ft.
3/4" domestic cold water pipe insulation	\$ _____ per lin. ft.
1" domestic cold water pipe insulation	\$ _____ per lin. ft.
1-1/4" domestic cold water pipe insulation	\$ _____ per lin. ft.
1-1/2" domestic cold water pipe insulation	\$ _____ per lin. ft.
2" domestic cold water pipe insulation	\$ _____ per lin. ft.
1/2" domestic hot and recirc. water pipe insulation	\$ _____ per lin. ft.
3/4" domestic hot and recirc. water pipe insulation	\$ _____ per lin. ft.
1" domestic hot and recirc. water pipe insulation	\$ _____ per lin. ft.
1-1/4" domestic hot and recirc. water pipe insulation	\$ _____ per lin. ft.
Ball Valve (water), under 1"	\$ _____ per unit
Ball Valve (water), 1"	\$ _____ per unit
Ball Valve (water), 1-1/4"	\$ _____ per unit
Ball Valve (water), 1-1/2"	\$ _____ per unit

Ball Valve (water), 2"	\$ _____ per unit
1" natural gas pipe below ground	\$ _____ per lin. ft.
1-1/4" natural gas pipe below ground	\$ _____ per lin. ft.
1" natural gas pipe above ground	\$ _____ per lin. ft.
1-1/4" natural gas pipe above ground	\$ _____ per lin. ft.
Ball Valve (Natural Gas), under 1"	\$ _____ per unit
Ball Valve (Natural Gas), 1"	\$ _____ per unit
Ball Valve (Natural Gas), 1-1/4"	\$ _____ per unit

**1.6 UNIT PRICES - HEATING AND VENTILATING: Materials in Place.**

Galvanized steel ductwork, no liner	\$ _____ per lb.
Galvanized steel ductwork, with liner	\$ _____ per lb.
Rigid duct insulation	\$ _____ per sq. ft.
3/4" heating hot water piping	\$ _____ per lin. ft.
1" heating hot water piping	\$ _____ per lin. ft.
1-1/4" heating hot water piping	\$ _____ per lin. ft.
1-1/2" heating hot water piping	\$ _____ per lin. ft.
2" heating hot water piping	\$ _____ per lin. ft.
3" heating hot water piping	\$ _____ per lin. ft.
4" heating hot water piping	\$ _____ per lin. ft.
3/4" heating hot water piping insulation	\$ _____ per lin. ft.
1" heating hot water piping insulation	\$ _____ per lin. ft.
1-1/4" heating hot water piping	\$ _____ per lin. ft.
1-1/2" heating hot water piping insulation	\$ _____ per lin. ft.
2" heating hot water piping insulation	\$ _____ per lin. ft.
Ball Valve (Hydronic), under 1"	\$ _____ per unit
Ball Valve (Hydronic), 1"	\$ _____ per unit

Ball Valve (Hydronic), 1-1/4"	\$ _____ per unit
Ball Valve (Hydronic), 1-1/2"	\$ _____ per unit
Ball Valve (Hydronic), 2"	\$ _____ per unit
Balancing Valve, 3/4"	\$ _____ per unit
Balancing Valve, 1"	\$ _____ per unit
Balancing Valve, 1-1/4"	\$ _____ per unit
Balancing Valve, 1-1/2"	\$ _____ per unit
3/4" two way control valve with actuator	\$ _____ per unit
1" two way control valve with actuator	\$ _____ per unit
1-1/4" two way control valve with actuator	\$ _____ per unit
1-1/2" two way control valve with actuator	\$ _____ per unit
2" two way control valve with actuator	\$ _____ per unit
Direct digital control system hydronic temperature sensor with thermal well	\$ _____ per unit
Direct digital control system airside temperature sensor (with no display and adjustment)	\$ _____ per unit
Direct digital control system airside temperature sensor (with display and adjustment)	\$ _____ per unit
Direct digital control system damper actuator	\$ _____ per unit
Direct digital control system communication bus wiring with conduit	\$ _____ per lin. ft.
Direct digital control system programming	\$ _____ per unit
Door contact with up to 100 ft of BMS wiring to a DDC controller	\$ _____ per unit

**1.7 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
Exterior weatherproof duplex power receptacle including up to 100 feet of (2)#12, (1)#12G, in 3/4" conduit	\$ _____ per unit

Wall mounted occupancy sensor, including wall box and wiring.	\$_____ per unit
Ceiling mounted occupancy sensor, including wiring.	\$_____ per unit
Ceiling mounted high bay occupancy sensor, including wiring.	\$_____ per unit
Corner mounted occupancy sensor, including wiring.	\$_____ per unit
Photosensor (daylight harvesting sensor), including wiring.	\$_____ per unit
Fire Alarm Pull Device, including outlet box and wiring	\$_____ per unit
Smoke Detector Device, including outlet box and wiring	\$_____ per unit
Heat Detector Device, including outlet box and wiring	\$_____ per unit
Duct Mounted Smoke Detector, including outlet box and wiring	\$_____ per unit
Carbon Monoxide Detector, including outlet box, wiring, and associated programming	\$_____ per unit
Duplex Data outlet box and 3/4" conduit extending above ceiling	\$_____ 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 / all Prime Contractors and his/her/their superintendents, 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 / Each 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 the contractor's field office 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 / all 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**

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## 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. **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. Division 2 through 16 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 the jurisdiction where the 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. Masonry in Seismic Design Category D (ICC, Section 1705.4),
  4. Soils (ICC Section 1705.6 and Table 1705.6),
  5. Fabrications (See Sections 05120, 05210, 05300, 05400),
  6. Sprayed Fire-Resistant Materials (ICC, Section 1705.14).
- 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 01505 - TEMPORARY FACILITIES**

### **PART 1 - GENERAL**

#### **1.1 DEFINITIONS**

- A. The Prime Contractor, for the District Maintenance and Operations Building project, shall be 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 their own activities.
  3. Their own field office, complete with necessary furniture, utilities and telephone service.
  4. Their own storage and fabrication sheds.
  5. All hoisting requirements for their work.
  6. Collection and disposal of their own debris, hazardous, unsanitary or other harmful waste material from their operations, on a daily basis to trash receptacles, hoppers, containers, etc. provided by the General Construction Work Contractor. Do not allow waste to accumulate inside building or on site. In addition, refer to Section 01524 Construction Waste Management.
  7. The secure lockup of their own tools, materials and equipment.
  8. Construction aids and miscellaneous services and facilities necessary exclusively for their own construction activities.
  9. Temporary storage provisions for their work, including offsite provisions, if required.
  10. Containerized bottled drinking water units for their personnel.
  11. Fire protection provisions related to their work.
  12. All personnel safety equipment and provisions for their personnel.
- B. The General Construction Work Contractor shall provide complete temporary safety programs for review and approval by, the Architect and the Owner.

- C. The General Construction Work Contractor shall be responsible for the following temporary facilities:
1. Administrative Facilities set forth in this Section for the exclusive use of the Owner, the Architect.
  2. Temporary access roads and paths to building, including access ways for cranes and trucks.
  3. Temporary toilets in sufficient quantity to suit project needs and including disposable supplies.
  4. Temporary insulated enclosure of the building, if required.
  5. Project identification signs.
  6. Rodent and pest control services.
  7. Barricades, warning lights, safety signage.
  8. Site enclosure fence, including maintenance and any gates needed. Provide fence relocations as needed during construction.
  9. Temporary grading to facilitate drainage from site.
  10. Environmental protections and erosion control, except for the truck wheel wash station.
  11. Snow and ice removal.
  12. Dewatering facilities.
  13. Dust and fume control
  14. Temporary storm sewer, if required.
  15. Tree and plant protection.
  16. Temporary partitions, whether or not shown on the drawings.
  17. Temporary covering for all openings in roof deck upon completion of erection of metal deck work.
  18. Temporary egress precautions routes for use when building is partially occupied, include but not limited to the following:



- a. Temporary doors and hardware.
  - b. Sidewalks
  - c. Fencing.
  - d. Signage whether shown or not on the drawings.
- D. The Structural Steel Subcontractor is responsible for the following temporary facilities and services:
1. Perimeter protection of elevated areas as set forth in this Section.
  2. Other temporary facilities and services stated as their responsibility elsewhere in the Project Documents.
- E. The Plumbing Work Subcontractor shall be responsible for the following temporary facilities and services:
1. Temporary facilities and services stated as their responsibility elsewhere in the Project Documents.
- F. The Heating Ventilation Air Conditioning and Refrigeration (HVACR) Subcontractor shall be responsible for the following temporary facilities and services:
1. Temporary HVACR system after enclosure of the building, in accordance with the requirements of the activity milestone schedule.
  2. Other temporary facilities and services stated as their responsibility elsewhere in the Project Documents.
- G. The Electrical Subcontractor shall be responsible for the following temporary facilities and services:
1. Electric service for security lighting, if required.
  2. Other temporary facilities and services stated as his/her responsibility elsewhere in the Project Documents.

## **1.2 OFFICE AND STORAGE FACILITIES**

- A. Each Contractor shall provide temporary office and storage facilities for their own use.

## **1.3 TEMPORARY RAILINGS AND PERIMETER PROTECTION**

- A. For all areas, the General Construction Work Contractor shall furnish, install, maintain and remove all initial safety protection work in full compliance with OSHA standards.
1. This work shall include but not be limited to, the protection of stair openings, shaft openings, safety railings and blocking at metal pan stairs prior to concrete

fill, except the portion of the work which is included in the scope of the Structural Steel Contractor stated below.

- a. For all areas, the Structural Steel Subcontractor shall furnish, install, maintain and remove all perimeter protection cable in full compliance with OSHA standards at all elevated areas, including the roof level.
- B. The Prime Contractor and each Subcontractor is responsible for the removal and immediate replacement, at the conclusion of their work, of all temporary protection measures as required in order to facilitate their work.
- C. No fall or opening protection shall be removed until the progress of the permanent work is installed in a manner that results in no hazard to any party.
- D. The installation of all barricades, enclosure, temporary partitions and other protective measures shall be performed in full compliance with the requirements of the New Jersey State Department of Labor, OSHA regulations and all other applicable Federal, State and Local laws.

#### **1.4 TEMPORARY CONSTRUCTION FENCE**

- A. Site Fence: Chain link fence.
  1. General Construction Work Contractor shall design and install to prevent easy access to site by people and animals.
  2. The entire construction site shall be enclosed with a 6' high chain link fence with modesty slats.
    - a. Provide gates, as required for access.
    - b. Do not remove until other security facilities, either temporary or permanent, are in place and in operation.
    - c. Relocate, as needed.
    - d. Furnish padlocks with keys for all personal, including the police and fire department.

#### **1.5 COMPRESSED AIR**

- A. Each Contractor shall furnish their own equipment and energy source to provide compressed air required for the completion of work under their contract.

#### **1.6 TEMPORARY HEAT**

- A. Prior to the building being enclosed by walls and roof, if the outside temperature shall fall below 40°F at any time during the day or night, and the work in progress requires heat for execution and protection, the General Construction Work Contractor shall furnish acceptable means to provide sufficient heat to maintain a temperature of 40°F for that portion of the work for all areas requiring heat.

1. Heating of field office, storage spaces, concrete and masonry shall be provided by each contractor under respective specification headings affected.
- C. As soon as the building is generally enclosed by walls and roof, the responsibility for supplying working area heat shall rest with the General Construction Work Contractor. The GC shall furnish sufficient heat by the use and maintenance of LP gas heaters to maintain a minimum temperature of 40°F within the enclosed area of the building at all times, and remove same when no longer required. The GC will be held responsible for freeze-ups for the duration of the forty (40) working day period following enclosure of the building. He/She shall remove soot smudges and other deposits from walls, ceilings, and all exposed surfaces, which are the result of the use of heating equipment. He/She shall not do any finish work until the areas are properly cleaned. The GC shall provide or arrange at his/her expense, supervision of the LP gas heaters at all times prior to start of the permanent heating contractor's obligation, which shall be forty (40) working days after the acknowledged enclosure of the building or buildings. The GC shall furnish and pay for all fuel.
1. All heating equipment shall be NBFU approved and connected to approved flues to the atmosphere. Gas cylinders within the building shall not exceed 100 lb. capacity, shall have Interstate Commerce Commission approval and shall be fitted with a permanent cap to protect the valve when not in use. Heaters shall be approved by a recognized testing laboratory and must be equipped with a positive shut-off safety valve. Cylinders and heaters shall stand at least six feet (6'-0") apart and be connected with two braid neoprene hoses that will withstand 400 psi test pressure.
  2. When cylinders and heaters are on the same floor, not more than one cylinder shall feed 400 sq. ft. of heated floor space. If cylinders feed heaters installed on a floor above, the area of heated floor may be increased to 600 sq. ft. Storage of cylinders within the building will not be permitted at any time. Fire extinguishers shall be provided on each floor where heaters are used, and the area must be ventilated.
  3. Contractors shall train at least two dependable persons to supervise heating installation at construction site.
- D. If the Heating and Ventilating Subcontractor does not provide operation of the permanent heating system within the 40 working day period, he/she will be liable for liquidated damages.
1. In like manner, if the Electrical and Plumbing Subcontractors do not provide the necessary electrical and plumbing work for operation of the permanent heating system, in sufficient time so that the 40 working day date can be met, they will be liable for the same Liquidated Damages.
- E. The GC shall continue to provide acceptable means of heat until the obligation of the permanent heating subcontractor shall become effective as herein stated. If the

permanent heating system is not acceptable to the Architect / Engineer for providing temporary heat, the General Construction Work Contractor shall continue to provide temporary heat as described above, at the expense of the HVACR or Electrical Subcontractor(s) responsible for the delay in operating the permanent heating system.

- F. At the termination of the 40 working day interval after notice has been given that the building is enclosed, the HVAC Subcontractor shall operate and maintain the heating system throughout the period that heat is required. The permanent heating system shall provide such heat to a minimum temperature of 55°F, or to such higher temperature not exceeding 75°F, as may be directed by the Architect, for the proper conduct and protection of the work until such time as work is completed and accepted. Accepting Heating system for use during the construction period shall not constitute acceptance of the complete system but merely acceptance of those components listed hereafter, which components will be covered by a one-year guarantee, unless otherwise indicated in Part-5 specification sections. Warranty shall be starting on the date of take-over.
- G. When the permanent heating system is used for temporary heat, the cost of electric power and fuel will be paid for by the General Construction Work Contractor. At the time of substantial completion for the entire project, Heating and Ventilating Subcontractor will clean or change all filters.
- H. Valves, traps and other parts of the heating system which are permanently installed by the Heating Subcontractor and used for supplying heat during the construction period need not be replaced, providing the system was in acceptable condition prior to its use, and further, that the system is properly cleaned and adjusted to operate after the permanent system is in use and to the satisfaction of the Architect / Engineer.
- I. If finishing of any surfaces is necessary to enable the Heating Subcontractor to install the heating system in manner to permit its use for supplying heat during the construction period, the finishing of such surfaces shall be done by the GC so as not to delay the installation of the permanent system. In the event this plastering or parging work is not completed in ample time to make possible the installation of permanent piping and heating units in a particular area, the permanent Heating Subcontractor shall install temporary piping and the heating units and cost of such temporary installation shall be paid by the GC.
- J. If additional heat is required beyond that specified herein, the Contractor requiring such additional heat shall pay for additional costs at no expense to the Owner.

## **1.7 TEMPORARY WATER**

- A. The Plumbing Subcontractor shall provide, protect and maintain an adequate water supply for the use of all contractors on the project during the period of construction, either by means of the permanent water supply line, or by the installation of a temporary water supply line. This water supply line shall be made available within

fifteen (15) days after written request has been made to the Plumbing Subcontractor by any contractor requiring this service, with copies to the Architect/Engineer.

1. If the Plumbing Subcontractor fails to carry out his responsibility in the supplying of the water, as set forth herein, he/she shall be held responsible for such failure and the Architect / Engineer shall have the right to take such action as he/she deems proper for the protection and conduct of the work and shall deduct the cost involved from the amount due the Plumbing Subcontractor.
- B. The Owner shall be responsible and pay all costs for water consumption.

## **1.8 TEMPORARY LIGHT AND POWER**

- A. Electrical Work Subcontractor - "EC" shall extend electrical service to the building or buildings, including temporary field offices, at locations approved by the Architect/Engineer. Initial temporary service shall be three phase or single phase, depending upon which phase is closest to the project. This service shall be installed within fifteen (15) days after written request has been made to the EC by the Prime Contractor or any Subcontractor requiring such service with copies to the Architect/Engineer. When the contract calls for 3-phase permanent service, the EC shall install same within six (6) months to permit use by other prime contractors. Electrical characteristics shall be provided to meet all temporary light and power requirements as herein and hereinafter specified or as included under Supplementary General Conditions. The EC shall provide the necessary distributing facilities and meter.
- B. The Electrical Work Subcontractor shall extend the service into the additions and/or renovated areas and shall provide receptacles and lighting as described herein and one (1) 5 HP 208 V. or 220 or 230 volts power outlet and one separate power outlet for each contractor for the proper conduct of his work. Power outlets shall be fed independently of the temporary lighting system. Where service of a type other than herein mentioned is required, the contractor requiring same shall install and pay all costs of such special services. The size and the incoming service and main distribution switch and panel shall be sized as any service by NEC requirements.
- C. The Electrical Work Subcontractor shall provide double sockets at a maximum of thirty feet (30') on centers in large areas. One socket shall contain a 150 watt lamp and the other socket shall be a grounding type to accept a receptacle plug for small single phase loads to be used for short periods of time. The Electrical Subcontractor shall provide double sockets of the type described above in all individual rooms, one double socket for each 500 sq. ft. or fraction thereof of room area (for example: a room 30' x 30' - 900 sq. ft. would require two double sockets).
- D. Temporary power and lighting services and maintenance shall be provided by the Electrical Work Subcontractor, including power required for temporary construction trailers, security and protection specified under other sections.

1. The General Construction Work Contractor shall be responsible and pay all costs for electrical consumption.
  2. On the date when the heating system is taken over by the Owner, the Electrical Work Subcontractor shall have the permanent service and distribution system in operation; this shall include service entrance and distribution equipment and power circuits to heating equipment. This will not, however, constitute acceptance of the electrical system.
- E. When the temporary electrical lines are no longer required they shall be removed by the Electrical Work Subcontractor and he/she shall restore to their original condition any part, or parts, of the ground or building, disturbed or damaged.
- F. Any Contractor who fails to carry out his responsibility in the supplying of uninterrupted light and power, as set forth in this contract, shall be held responsible for such failure and the Architect shall have the right to take such action as he/she deems proper for the protection and conduct of the work and shall deduct the costs involved from the amount due the contractor at fault.
- G. There shall be no additional cost to the Owner or other prime contractors because of standby requirements due to conflict in the normal working hours of the various trades.
1. Electrical Subcontractor shall provide temporary light and power required to meet all working days and hours of all trades and such light and power shall be available fifteen (15) minutes before the start of the earliest scheduled work and will continue until fifteen (15) minutes after the end of the latest scheduled work on each and every day.
  2. Any additional Cost associated with any temporary light and power required during additional shifts, weekends or holidays shall be the responsibility of the Prime Contractor or Subcontractors, and shall be paid directly to the Electrical Subcontractor.
  3. Contractor(s) causing delay shall be liable for same Liquidated Damages amount per day in accordance with the Contract Documents.
- H. The Electrical Work Subcontractor shall observe the current requirements of the Federal Occupational Safety and Health Act of 1970 with regard to temporary light and power.
- I. Electric Welding Equipment, Terrazzo Grinders, Pipe Threading Equipment, Floor Sanders: The Electrical Work Subcontractor shall provide at locations acceptable to prime contractors involved two (2) outlets - 208, 220, 230 volts 60 cycle - three phase (single phase if 3-phase not available), 7-1/2 HP maximum capacity for the Prime Contractor and/or Subcontractors using the referenced equipment. Should any contractor desire additional outlets or service of this type beyond the specified two

outlets or service of a greater capacity or of different characteristics or for any other power equipment, he/she shall arrange with the Electrical Work Subcontractor for the installation and pay all costs involved.

1. The Prime Contractor is obligated to employ standby personnel by trade agreement to which he/she is a party shall determine and include all such costs thereof in his / her bid proposal.
2. Any conflict arising between the Prime Contractor and Subcontractors with regard to financial obligations for standby personnel or standby supervisory employees when the maximum number of units are provided, shall be resolved between the parties involved in direct proportion to the number of units on the site by the respective contractors.
3. No Contractor shall at any time set up claim for an extra relating to costs of standby maintenance or standby supervision for electric motor driven equipment. The Owner under no conditions will entertain or consider an extra in this regard.
  - a. Contractor(s) causing delay shall be liable for same Liquidated Damages amount per day in accordance with the Contract Documents.

## **1.9 TOILET FACILITIES**

- A. The General Construction Work Contractor shall provide and maintain in a neat and sanitary condition temporary toilet facilities for the use of all Contractors and persons employed on the work or connected therewith.
  1. Such facilities shall comply with the regulations of the local Department of Health and other bodies having jurisdiction.
  2. Such facilities shall be in sufficient quantity to suit manpower working on site.
  3. Place units in a flat and easily accessible location.
  4. Provide servicing for units once per week as a minimum requirements.

## **1.10 TEMPORARY ROADWAYS**

- A. The General Construction Work Contractor shall provide and maintain temporary roads, parking areas and paths as may be necessary for the work. The GC Shall construct temporary roads and ramps as may be required by other Prime Subcontractors for crane and truck access. The roadways shall be suitable for large trucks to deliver items to the buildings. Other contractors shall be allowed to use the temporary roadways. In location, the temporary roads and parking areas may coincide with the permanent roadways and parking areas. Stone used in the construction of temporary roadways and parking areas may be left in place only if it occurs below the subgrade elevation for the permanent work.

## **1.11 PROJECT IDENTIFICATION AND TEMPORARY SIGNS**

- A. The General Construction Work Contractor shall prepare Project Identification Sign

in sizes indicated. Provide signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.

1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details and colors as indicated or as directed by the Architect / Owner.
- B. Prepare temporary signs to provide directional information to construction personnel and visitors.
- C. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
- D. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.
- E. No other signs will be allowed without Architect's approval.

#### **1.12 REMOVAL AND RESTORATION**

- A. Prior to acceptance of the Project, each Contractor shall remove the temporary work for which he/she has been responsible.
- B. Each Contractor shall restore all areas affected by temporary facilities for which he/she has been responsible.

**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 / Each 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. Plumbing and Drainage Work
  4. HVACR Work
  5. Electrical Work

## **1.5 PROJECT SPECIFICATION MANUAL**

- A. The / Each 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. Submit pest-control final inspection report and warranty.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. 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 from lowest floor to highest floor**, 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.
  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. Remove snow and ice to provide safe access to building.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. 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.
- m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to unusual operating conditions.
- o. Plumbing Work Contractor shall clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. 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.
- q. 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.
- r. Leave Project clean and ready for occupancy.
- s. The General Construction Work Contractor, prior to Owner's occupancy, shall engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a

report and submit to the Owner. The General Construction Work Contractor shall also perform or have performed the following immediately prior to the Architect inspection for Substantial Completion:

- 1) Removal of all manufacturer's temporary labels from materials, equipment and fixtures.
  - 2) Removal of all stains from glass and mirrors; wash, polish, inside and outside.
  - 3) Removal of marks, stains, fingerprints, other soil, dust, dirt, from painted, decorated or stained woodwork, plaster or plasterboard, metal, acoustic tile, and equipment surfaces.
  - 4) Removal of spots, paint, soil from resilient flooring.
  - 5) Removal of temporary floor protections, clean, wax or otherwise treat as directed, polish all finished floors. Final vacuum all carpet.
  - 6) Clean all interior finished surfaces, including doors and window frames and hardware required to have a polished finish, of oil, stains, dust, dirt, paint and the like; leave without fingerprints, blemishes.
  - 7) Final site clean-up shall extend beyond the Contract Limit Lines as reasonable required to insure the complete removal of all construction debris from the entire site, including staging areas and shall be in accordance with requirements of the Contract Documents.
- t. 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(s) 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(s) when he/she/they is/are 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 et seq.
  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. Copies of application for permits and certificate, current forms (R-GP-005), completed and approved by the New Jersey Department of Environmental Protection.
  - a. General Permit Registration form for Emergency Generator(s).
12. Fire Alarm Certification and Description - N.F.P.A. Form 72C. Provide Owner with complete software program information (Microprocessor or Control Module as applicable).
13. Certificate of Occupancy / Copies of all Building Department inspection approvals.
14. 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.
15. **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.
16. 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

<b>Owner</b>		
<b>Title</b>		
<b>Project #</b>		<b>Contract:</b>
<b>Contractor</b>		
<b>Substantial Completion Date:</b>		<b>Updated:</b>
<b>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&amp;M manuals, reports, certifications, warranties, punch list must be submitted to Engineer for review.</b>		
<b>Item No.</b>	<b>Documents &amp; Warranties Required For Closeout</b>	<b>Status</b>
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 <b>(2 each in 3-ring binder)</b>	
12	Record Drawings. Indicate As-Built drawings with company name, address and date <b>(1 Paper Set &amp; 2 CD's)</b>	
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. **Contractor to review permitted work hours to comply with the local "Noise Ordinance".**
  - 3. **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 **seven (7)** calendar days, Sundays and Holiday's excepted, from **Notice of Award**; on or about **August 25, 2020**.

2. Contractor submits Bonds and Insurance **ten (10) calendar days from Notice of Award, Sundays and holidays excepted.**
3. **Notice to Proceed** shall be within **three (3) business days** of date of signing Contract; on or about **September 4, 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 **forty-five (45) calendar days from Notice to Proceed.**

H. **Milestone No. 4**

1. Physical work at the site shall commence on or about **September 14, 2020.**

I. **Milestone No. 5**

1. Substantial Completion of the entire project shall be on or before **204 Calendar Days from the Notice to Proceed, March 26, 2021.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

J. **Milestone No. 6**

1. Final Completion of all Work including punch list items and closeout documents, no later than **30 Calendar Days from Substantial Completion, April 26, 2021.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

K. 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.

L. 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.

- M. 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.
- N. 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.
- O. 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**

## 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. Finish Grading & Seeding as specified in Section 02485.
  - 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. Unit Masonry Work as specified in Section 04200.
  - 1. The Contractor shall warrant the exterior walls to be free from leakage due to any natural cause for a period of **five (5) years** from date of final acceptance of the building and he/she shall, within such period at his/her own expense, upon written notification from the Owner, pursue such remedial measures as may be necessary to correct any condition of leakage and damage incidental thereto that may develop. The Contractor in signing this Contract accepts the above conditions. In so doing, he/she also agrees either that the materials and methods specified herein are such as to insure the results required or that he/she will, at no additional expense, furnish such additional or alternative items of labor and materials (or both) as may be necessary to accomplish the stated intent of the Contract.
  - 2. 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.

C. Solid Polymer Fabrications as specified in Section 06650.

1. Provide manufacturer's warranty against defects in materials, fabrication and installation, excluding damages caused by physical or chemical abuse or excessive heat. Warranty shall provide for replacement or repair of material and labor for a period of **ten (10) years**, beginning at Date of Substantial Completion.
  - a. For fabrications with installed warranty coverage, identify by affixing manufacturer's fabrication/installation source plate.

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. 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.

F. 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.

G. 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 warranty shall also include refinishing and reinstallation as may be required due to repair or replacement of defective doors.

H. Insulated Rolling Service Door as specified in Section 08330.

1. Standard Warranty: **Two (2) year** warranty from date of shipment against defects in materials and workmanship.

I. FRP Doors and Alum. Framing System 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.

- J. Windows as specified in Section 08520.
1. Submit two (2) copies of written guarantee, signed by the Contractor, Installer and Manufacturer, agreeing to replace window work which fails in materials or workmanship within **ten (10) years** of the date of acceptance. Failure of materials or workmanship shall include but not be limited to excess air infiltration, excessive deflections, delamination of panels, deterioration of finish of metal in excess of normal weathering and defects in accessories, weatherstripping and other components of the work.
- K. 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 **two (2) years** 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.
- L. 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.
- O. Security Glazing as specified in Section 08871.

1. General: Submit warranties provided by the manufacturer agreeing to repair or replace defective material or workmanship within the specified warranty periods, starting from the date of substantial completion.
  - a. Insulated Security Glass Units: Submit a ten (10) year warranty against defects including loss of seal, interior clouding, and discoloration.
  
- P. Tile as specified in Section 09300.
  1. Limited Warranty:
    - a. Manufacturer warrants that manufactured products will be free from defect for a period of **one (1) year** from date of purchase.
      - 1) Defect is defined as a shortfall in the product to perform to manufacturer's specifications as disclosed in product literature, within industry allowable tolerances as set forth in standard, national industry protocols.
      - 2) Manufacturer provides detailed information in its product literature regarding appropriate tile and stone applications. Failure to comply with recommended applications voids this warranty.
  
- Q. Acoustical Ceilings and Suspension System as specified in Section 09510.
  1. Special Manufacturer's Warranty: Written warranty, signed by the ceiling manufacturer agreeing to furnish ceiling materials and replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  2. Warranty Period: **Thirty (30) year** System Performance Guarantee against visible sag, Mold/Mildew and Bacteria Growth.
  
- R. 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.

S. Carpet Tile as specified in Section 09685.

1. Manufacturer shall issue a **Lifetime Commercial Limited warranty** from the date of Substantial Completion.
2. Special Project Warranty:
  - a. 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.

T. Dry Marker Boards / Exhibition Boards as specified in Section 10100.

1. Submit a **"Life of Building"** warranty, stating that under normal usage and maintenance, and when installed in accordance with manufacturer's instructions and recommendations, porcelain enamel steel markerboard and chalkboard writing surfaces are guaranteed for the Life of the Building. Guarantee covers replacement of defective boards, but does not include cost of removal or reinstallation.
2. Submit a standard warranty, stating that when installed in accordance with manufacturer's instructions and recommendations, exhibition boards are guaranteed for **one (1) year** against defects in materials and workmanship. Guarantee does not cover normal wear and tear, improper handling, any misuse, or any defects caused by vandalism or subsequent abuse. Guarantee covers replacement of defective material, but does not include cost of removal or reinstallation.
3. Writing Surface Warranty Period: Lifetime of the building commencing on the Date of Substantial Completion.

U. Solid Plastic Toilet and Bath Partitions as specified in Section 10161.

1. Submit manufacturer's written guarantee to the Architect and the Owner which guarantees its plastic against breakage, corrosion and delamination under normal

conditions for **twenty-five (25) years** from date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge (labor not included in warranty).

V. Canopy as specified in Section 10731.

1. Canopy framing must have a **ten (10) year** limited warranty on paint finish.
2. Canopy roof panels from pre-finished coil stock must have a **twenty (20) year** limited warranty on paint finish.

W. Toilet and Bath Accessories as specified in Section 10800.

1. Washroom Accessories: Warranty is limited to replacing or repairing, at the manufacturer's option, transportation charges prepaid by the purchaser, any washroom accessory unit or part thereof which their inspection shall show to have been defective within the limitation of the warranty. Period of warranty is measured from the date of their invoice as follows:
  - a. Complete unit (except mirrors) - **One (1) year**.
  - b. Stainless Steel Mirror Frames - **Fifteen (15) years** - against corrosion.
  - c. Tempered Glass Mirrors - **Five (5) years** - against silver spoilage.
  - d. Polished #8 Architectural Grade Finish on 304 Series Stainless Steel - **One (1) year** against corrosion.
  - e. Bright Annealed Finish on 430 Series Stainless Steel - **One (1) year** against corrosion.

\* Warranties do not cover installation labor charges and does not apply to any units which have been damaged by accident, abuse, improper installation, improper maintenance, or altered in any way.

X. Metal Building Systems as specified in Section 13341.

1. All materials will be covered under the MBMA's required **one (1) year** manufacturer's defect warranty to replace any defective materials.
2. Roof panels and trims are covered under the coatings manufactures **forty (40) year** warranty (this varies by color and building site location see coatings manufacturer's warranty for restrictions) against blistering, peeling, cracking, or checking.

### 1.3 CASEWORK AND EQUIPMENT WORK

A. Casework (Solid Wood) as specified in Section 11011.

1. Manufacturer shall warrant the casework to be free from defects in materials and workmanship, under normal use and service, for **three (3) years** from date of delivery.

- a. Within the warranty period, manufacturer shall repair, replace, or refund the purchase price of defective casework.

#### 1.4 PLUMBING & DRAINAGE WORK

A. General Requirements Plumbing as specified in Section 220010.

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 Plumbing 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 the 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. Sanitary Waste and Vent Piping as specified in Section 221316.

1. Listed manufacturers to provide labeling and warranty of their respective products.

C. Fuel-Fired, Domestic-Water Heaters as specified in Section 223400.

1. Special Warranty: Manufacturer agrees to repair or replace components of fuel-fired, domestic-water heaters that fail in materials or workmanship within specified warranty period.
  - a. Failures include, but are not limited to, the following:
    - 1) Structural failures including storage tank and supports.
    - 2) Faulty operation of controls.
    - 3) Deterioration of metals, metal finishes, and other materials beyond normal use.
  - b. Warranty Periods: From date of Substantial Completion.
    - 1) Commercial, Gas-Fired, Storage, Domestic-Water Heaters:
      - a) Storage Tank: **Five years.**
      - b) Controls and Other Components: **One year(s).**
    - 2) Expansion Tanks: **Five years.**

D. Pressure Water Coolers as specified in Section 224716.

1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of water cooler that fail in materials or workmanship within specified warranty period
  - a. Failures include, but are not limited to, the following:
    - 1) Refrigeration System.
    - 2) Electrical components and water system.

- b. Warranty Periods: From date of Substantial Completion.
  - 1) Water coolers:
    - a) Refrigeration System: **Five years.**
    - b) Electrical components and water system: **One year.**

## 1.5 HEATING, VENTILATING, AIR CONDITIONING AND REFRIGERATION WORK

### A. General Requirements HVAC as specified in Section 230010.

- 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 HVAC 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. Direct Digital Control (DDC) System for HVAC as specified in Section 230923.

- 1. **12 months** after project substantial completion. Control system failures during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to Owner. Respond during normal business hours within 24 hours of Owner's warranty service request.
- 2. Work shall have a single warranty date, even if Owner received beneficial use due to early system start-up. If specified work is split into multiple contracts or a multi-phase contract, each contract or phase shall have a separate warranty start date and period.

### C. Gas Vents as specified in Section 235123.

- 1. Warranty Period: **10 years** from date of substantial completion.

### D. Condensing Boilers as specified in Section 235216.

- 1. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of boilers that fail in materials or workmanship within specified warranty period.
  - a. Warranty Period for Wall-Hung Fire-Tube Condensing Boilers:
    - 1) Heat Exchanger and Tank: Free from defects in material and workmanship.
    - 2) Warranty Coverage: **10 years** from date of Substantial Completion.

### E. Packaged Compressor and Condenser Units as specified in Section 236200.

1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of compressor and condenser units that fail in materials or workmanship within specified warranty period.
  - a. Failures include, but are not limited to, the following:
    - 1) Compressor failure.
    - 2) Condenser coil leak.
  - b. Warranty Period (Compressor Only): **Five years** from date of Substantial Completion.
  - c. Warranty Period (Components Other Than Compressor): **One year** from date of Substantial Completion.

F. Indoor, Air-Handling Units as specified in Section 237313.16.

1. Manufacturer shall provide a limited "parts only" warranty for a period of **12 months** from the date of equipment start up **or 18 months** from the date of original equipment shipment from the factory, whichever is less. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation, and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and air filters.

G. Ductless Split-System Air-Conditioning Units as specified in Section 238127.

1. Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of split-system air-conditioning units that fail in materials or workmanship.
2. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.
  - a. Warranty Period:
    - 1) For Compressor: **Five year(s)** from date of Substantial Completion.
    - 2) For Parts: **One year** from date of Substantial Completion.
    - 3) For Labor: **One year** from date of Substantial Completion.

## 1.6 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 software.
    - 2) Faulty operation of lighting control devices.
  - b. Warranty Period: **Two year(s)** from date of Substantial Completion.

C. Packaged Engine Generators as specified in Section 263213.

1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.
  - a. Warranty Period: **Five (5) years** from date of Substantial Completion.

D. Interior Lighting as specified in Section 265119.

1. Special Warranty for Fluorescent Light Fixture Ballasts: Manufacturer's standard form in which ballast manufacturer agrees to repair or replace ballasts that fail in materials or workmanship within specified warranty period.
  - a. Warranty Period for Electronic Ballasts: **Five years** from date of Substantial Completion.
2. LED light fixtures provided as a part of this project shall be provided with a **5 year** warranty.

E. Fire Alarm System as specified in Section 283111.

1. The contractor shall warranty all materials, installation and workmanship for **one (1) year** from date of acceptance, unless otherwise specified. A copy of the manufacturers' warranty shall be provided with closeout documentation and included with the operation and installation manuals.

2. The System Supplier shall maintain a service organization with adequate spare parts stocked within 75 miles of the installation. Any defects that render the system inoperative shall be repaired within 24 hours of the Owner notifying the contractor.
3. Technical Support: Beginning with Substantial Completion, provide software support for **one (1) year**, shall be included in this project.
4. Detector Sensitivity Testing: During the warranty period, each year the contractor is to perform detector sensitivity testing and provide report to the Owner. Unless, the system is UL Listed to perform automatic sensitivity testing without any manual intervention and should detector fall outside of sensitivity window, the system will automatically indicate a device trouble. A copy of UL letter is to be provided as proof of system operation.
5. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within three (3) years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
  - a. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

**END OF SECTION 01900**

## **SECTION 01950 - SUBSOIL**

### **1. GENERAL**

- A. The attached subsurface investigation was developed by Professional Engineers at the request of the Owner.
- B. Additional surveys, test borings and other exploratory operations may be made by Contractor at no cost to Owner.
- C. The Architect and Owner assume no liability or responsibility for the accuracy of this report and for conclusions drawn therefrom.
- D. See Report for Test Boring Location Plan.

**END OF SECTION 01950**

**SOIL AND FOUNDATION  
ENGINEERING REPORT**

**PROPOSED MAINTENANCE BUILDING**

**101 South Reeds Road  
Galloway Township  
Atlantic County, New Jersey**

**FOR**

**EDWARDS ENGINEERING GROUP**

**69 W End Avenue  
Somerville, NJ 08876**

**December 30, 2019 – Revised 1/24/2020**

**UNDERWOOD ENGINEERING COMPANY  
U.E. Reference No: 4628-12571-1 (WO 19-3257)**

# UNDERWOOD ENGINEERING COMPANY

## SOIL & FOUNDATION ENGINEERING

143 Harding Ave. Bellmawr, NJ 08031

William R. Underwood, PE - President

Phone (856) 933-1818 Fax (856) 933-3121

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12/30/2019 – Revised 1/24/2020

### Edwards Engineering Group

69 W. End Avenue  
Somerville, NJ 08876

RE: Soil and Foundation Engineering Report  
Proposed Maintenance Building  
101 South Reeds Road  
Galloway Township  
Atlantic County, New Jersey

U.E. Reference No: 4628-12571-1 (WO 19-3257)

Sir / Madame:

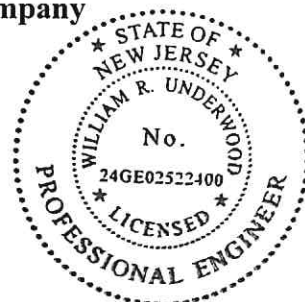
Underwood Engineering Company has been retained by Edwards Engineering Group, to perform a soil investigation, analysis and to make recommendations for the most suitable foundation system for the above referenced project. Presented herewith is the required information.

We appreciate the opportunity of working with you on this project. If we may be of further assistance, please do not hesitate to contact our office.

Respectfully submitted,  
**Underwood Engineering Company**



William R. Underwood, P.E.  
President



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## **I SITE DESCRIPTION**

### **A. Location**

The building site is located along the North Side of Reeds Road Elementary School adjacent to the existing stormwater management area at 101 South Reeds Road, Galloway Township, Atlantic County, New Jersey.

### **B. Surface Conditions**

The proposed building area is presently a vacant grass field adjacent to the existing stormwater management area (Wet pond with water elevation at approximately 38.00).

In general, the proposed building area is flat with existing ground surface elevations ranging from approximate elevation 42.00 to 43.00.

### **C. Project Plans**

A site plan showing the proposed building location was prepared by FVHD Architects Planners, dated XX.XX.XXX, Entitled “Overall Site Plan Proposed Maintenance Building, 101 South Reeds Road, Galloway, NJ 08205”.

A floor plan showing the proposed building layout was prepared by FVHD Architects Planners, dated XX.XX.XXX, Entitled “Overall Floor Plan, Proposed Maintenance Building, 101 South Reeds Road, Galloway, NJ 08205”.

A site plan showing the existing stormwater management area with proposed test boring locations was prepared by Edwards Engineering Group and provided via email on December 18, 2019, Entitled “Reeds Rd Soil Testing Locations.”

## **II PROJECT DESCRIPTION**

### **A. Type of Structure**

The project is to consist of the proposed construction of a new one story, maintenance building with administration offices and an area for future expansion. The proposed building measures approximately 148 feet long by 64 feet wide and the future expansion measures approximately 100 feet long by 64 feet wide. Framework for the proposed building is anticipated to be structural steel and masonry, concrete slab on grade construction.

The project will also consist of a proposed parking lot and drive aisle to service the new building along with the expansion of the existing wet stormwater management pond.

### **B. Loads & Spacings**

Loads and spacings are anticipated to be typical for this type of construction, i.e., no extraordinary loads are anticipated.

### **C. Finished Floor Elevations**

Project grading was not available for review as of the published date of this report. All project grading information is to be supplied to Underwood Engineering Company as it is made available so that additions, corrections or modifications to the recommendations contained herein may be made, if necessary.

The proposed finished floor elevations are assumed to approximate the existing grade elevations.



### III FIELD INVESTIGATION & SUBSURFACE CONDITIONS

#### A. Field & Laboratory Investigations

##### 1) Borings & Laboratory Permeability Testing

The field investigation consisted of three (3) test borings advanced to depths of approximately twenty (20) feet below the existing ground surface elevations and two (2) test borings advanced to depths of approximately sixteen (16) feet below the existing ground surface elevations with standard penetration resistance per ASTM D-1586 on December 27, 2019.

Four (4) representative soil samples were obtained in the test borings and returned to our laboratory for Hydraulic Conductivity Constant Head testing per ASTM D 5084.

The findings and locations are shown in Appendices A and B to include the Boring Location Plan and Soil Boring Logs.

The site soils encountered in test borings TB-1 through TB-5 directly below the existing ground surface elevations consisted generally of very loose, loose and medium dense fine to coarse sands with trace / little / some amounts of silts and trace amounts of gravel. Based on Standard Penetration Test (SPT) data recorded during the drilling operations test borings TB-1 through TB-5 are considered loose to depths of approximately five (5), eight (8) and twelve (12) feet below the existing ground surface elevations.

Test borings TB-4 & TB-5 were terminated in the medium dense sands at depths of approximately sixteen (16) feet below the existing ground surface elevations. Test borings TB-1 through TB-3 were terminated in the medium dense sands at depths of approximately twenty (20) feet below the existing ground surface elevations.

See attached Soil Boring Logs (Appendix B) for more detailed soil descriptions and profiles.

2) Laboratory Permeability Results

The table below illustrates the soil permeability rates at the areas tested per ASTM D 5084.

<b>Test Boring Location</b>	<b>Depth of Test Below Existing Ground Surface Elevation</b>	<b>Soil Classification at Test Location</b>	<b>Infiltration Rate (in./hr.)</b>
TB-4	10 ft.	f/m SAND, (l.) Silt & Clay	4.67
TB-4	6 ft.	f/m SAND, (tr.) Silt & Clay	10.50
TB-5	13 ft.	f/c SAND, (tr.) Silt & Clay	21.64
TB-5	6 ft.	f/m SAND, (l.) Silt & Clay	5.99

3) Water Table

The ground water table was encountered at depths of approximately ten (10) and twelve (12) feet below the existing ground surface elevations in the test borings as evidenced by direct observation and saturation of the soil samples.

The estimated seasonal high-water table (ESHW), as indicated by mottling and soil textures was observed at depths of approximately eight (8) feet below the existing ground surface elevations in the test borings.

It should be noted that groundwater data presented on the individual test boring logs may not be representative of daily or seasonal variations in the ground water level. The seasonal high-water table as indicated by mottling and other soil characteristics is only an average based on long-term fluctuations in groundwater. Actual groundwater tables may

significantly vary from average annual seasonal highs, based on precipitation frequencies and other factors.

#### IV RECOMMENDATIONS

##### A. Earthwork

###### 1) Existing Topsoil & Deleterious Conditions

All existing topsoil, vegetation, and all deleterious materials are to be removed from the proposed building and paved areas.

###### 2) Construction Dewatering

The dewatering specifications should be of a type capable of maintaining the water table a minimum of two (2) feet below the prevailing excavation bottom during the excavations as well as during backfill operations. As stated above, groundwater and/or perched water levels encountered during construction may vary from those encountered during soil boring operations due to seasonal variations or other climatic conditions. Should perched water be encountered during foundation excavations and utility trenches, etc., temporary dewatering may be required i.e. installation of sump pits/pumps.

###### 3) Proofrolling & Densification

The exposed subgrades for the slab on grades and any paved areas are to be proofrolled with a vibratory compactor in the presence of the soil engineer to detect and repair any unsuitable soil conditions and to attain a uniform firm subgrade throughout. Any loose soils encountered may be densified by proofrolling and further compaction by additional passes if necessary. This is extremely important due to areas of loose soils encountered in the test borings.

Prior to placement of structural fills and foundations, building pad area subgrades are to be densified utilizing a 20-ton equivalent vibratory compactor. A minimum of six (6) passes over the building subgrade areas is recommended.

4) Structural Fill Placement

Bring existing grade up to the desired elevation with a granular type soil that complies with the following specifications or soils which are reviewed and approved by the soil engineer and compact it to within the specifications listed under **Compaction**, unless approved by the Soils Engineer.

<u>SIEVE SIZE</u>	<u>Percent by Weight Passing Square Mesh Sieve</u>
2"	100
3/4"	70-100
#4	30-80
#50	10-35
#200	5-12

It is strongly recommended that bulk samples of material to be used as load bearing structural fill be taken and tested prior to the commencement of work so that moisture / density relationships (compaction) can be determined.

5) On Site Soils

On site granular soils, as approved by the Soil Engineer, are suitable for use, as load-bearing fill but will require strict moisture control due to the presence of fine grain material (i.e. silt and clay). If on site soils are used as structural fill, they must be placed under favorable weather conditions for the soils to dry within optimum moisture content ranges. This is extremely important in order to properly compact the soils as specified herein. If inclement weather is a factor, the onsite soils may be

unsuitable, and provisions should be taken to import suitable structural materials and / or the use of moisture reducing applications.

6) Backfilling & Densification of Load-Bearing Fill

Building subgrades may be brought up to desired elevation with approved on-site soils or imported structural fill in lifts no greater than twelve (12) inches loose thickness and compacted to 95% of the material's maximum dry density per ASTM D-698 as illustrated below. Materials compacted by hand operated equipment shall be placed in lifts no greater than four (4) inches loose thickness.

7) Compaction

All backfill and fill materials should be compacted to the degree noted in the following table in accordance with ASTM D-698 latest standard.

<u>Building Area</u>	<u>% Maximum Dry Density (ASTM D-698)</u>
Supporting Foundations	95%
Supporting Floor Slabs	95%
Pavements	95%
Site (Non Load Bearing)	90%

8) Foundation Compaction

All exposed footing subgrades are to be compacted by two (2) passes with a jumping jack compactor immediately prior to the placement of the footing concrete.

B. Building Foundation

1) Type – Conventional Spread Footings

The proposed building is to be placed on a spread footing foundation system. Soils in the area of the proposed structure are to be improved as follows:

a) Ground Improvement - Soil Removal & Replacement

Remove two (2) feet of the loose soils beneath the slab-on- grade subgrade foundation areas to a width of five (5) feet beyond the building lines to stable natural ground. Deeper excavations may be required where fill / loose soils are encountered in areas other than those identified during the initial subsurface investigation.

Densify the exposed subgrade with a minimum of six (6) passes with a twenty (20) ton equivalent vibratory compactor to 95 % of the material's maximum dry density per ASTM D-698.

Backfill and densify approved structural fill (**over excavated loose granular soils screened free of any organic materials or imported structural fill**) to 95 % the materials maximum dry density in accordance with recommendations listed under **Compaction**.

Backfill materials are to be brought up to design subgrade in lifts no greater than twelve (12) inches loose thickness as detailed above.

2) Elevation

The footings may be placed at any elevation provided the minimum depth criteria is met and the recommendations listed herein are performed.

3) Minimum Depth of Foundation

All footing bottoms are to be founded at least three (3) feet beneath or away from atmospherically exposed final soil subgrade.

4) Allowable Bearing Values

The spread footing foundations may be designed for a maximum allowable bearing capacity of 3,000 Pounds per Square Foot provided that the requirements under Earthwork are adhered to strictly.

5) Settlements

Using the allowable bearing value and following the recommendations under Earthwork will keep total and differential settlements negligible.

C. Lateral Earth Pressures

The following values may be used for calculating lateral earth pressures:

Active Earth Pressure Coefficient,  $K_A = 0.32$

At Rest Earth Pressure Coefficient,  $K_R = 0.40$

Passive Earth Pressure Coefficient,  $K_P = 4.00$

Unit Weight of Soil,  $\gamma = 120 \text{ lbs. / ft}^3$

The above values assume a porous, free draining backfill soil.

D. Seismic Considerations

For Seismic Site Classification, use Site Class **D**<sup>1</sup>.

E. Concrete Floor Slabs

Concrete floor slabs may be placed on grade provided they underlain by a minimum of four (4) inches of porous material and all soft areas are to be removed and repaired as recommended under Earthwork.

---

<sup>1</sup> Data obtained from International Building Code

F. Paved Areas

1) Subgrade Preparation

After the procedures as outlined under Proofrolling are completed, the subgrade should be compacted to 95% of the material's Maximum Dry Density (ASTM D-698). Prior to the installation of the bituminous base course the subgrade is to be proofrolled with a loaded ten-wheel dump truck in the presence of the soils engineer. This is extremely important and will be the primary criteria for subgrade acceptance. Any localized weak areas are to be repaired.

2) Design Criteria

In the design of pavements, a maximum CBR value of ten (10) should be used.

3) Stone Base Course

Pavement areas are to be provided with at least a four (4) inch thick crushed stone or coarse gravel base course.

4) Reinforcing Fabric

A geotechnical reinforcing fabric (Mirafi 500X or equal) should be considered for placement under any heavy traffic areas.



## V INSPECTION

It is recommended that all earthwork operations be inspected full time by a qualified representative of the Soil Engineer, especially the proofrolling operations and all footing subgrades immediately prior to placing the footing concrete. Foundation excavation evaluations should be performed to confirm that the design allowable bearing pressure is available. Footing subgrade evaluations should be performed through a combination of visual observation and hand rod probing in conjunction with comparison to the test borings. Concrete placement should be performed immediately after footing subgrade evaluations are made to prevent exposure and potential weakening of foundation subgrades.

## VI QUALIFICATIONS

Our recommendations are based on the subsurface conditions as revealed by the test borings, and on the assumptions outlined in the Project Description and Site Description sections of this report.

Our recommendations are also based on the assumption that the provisions for strict field inspection will be followed as outlined.

This report does not reflect any variations, which may be encountered during construction.

We should be informed immediately of such conditions so that we may modify our conclusions and recommendations, if necessary.

Underwood Engineering Company will not be responsible for variations in subsurface soils encountered in areas other than those tested.

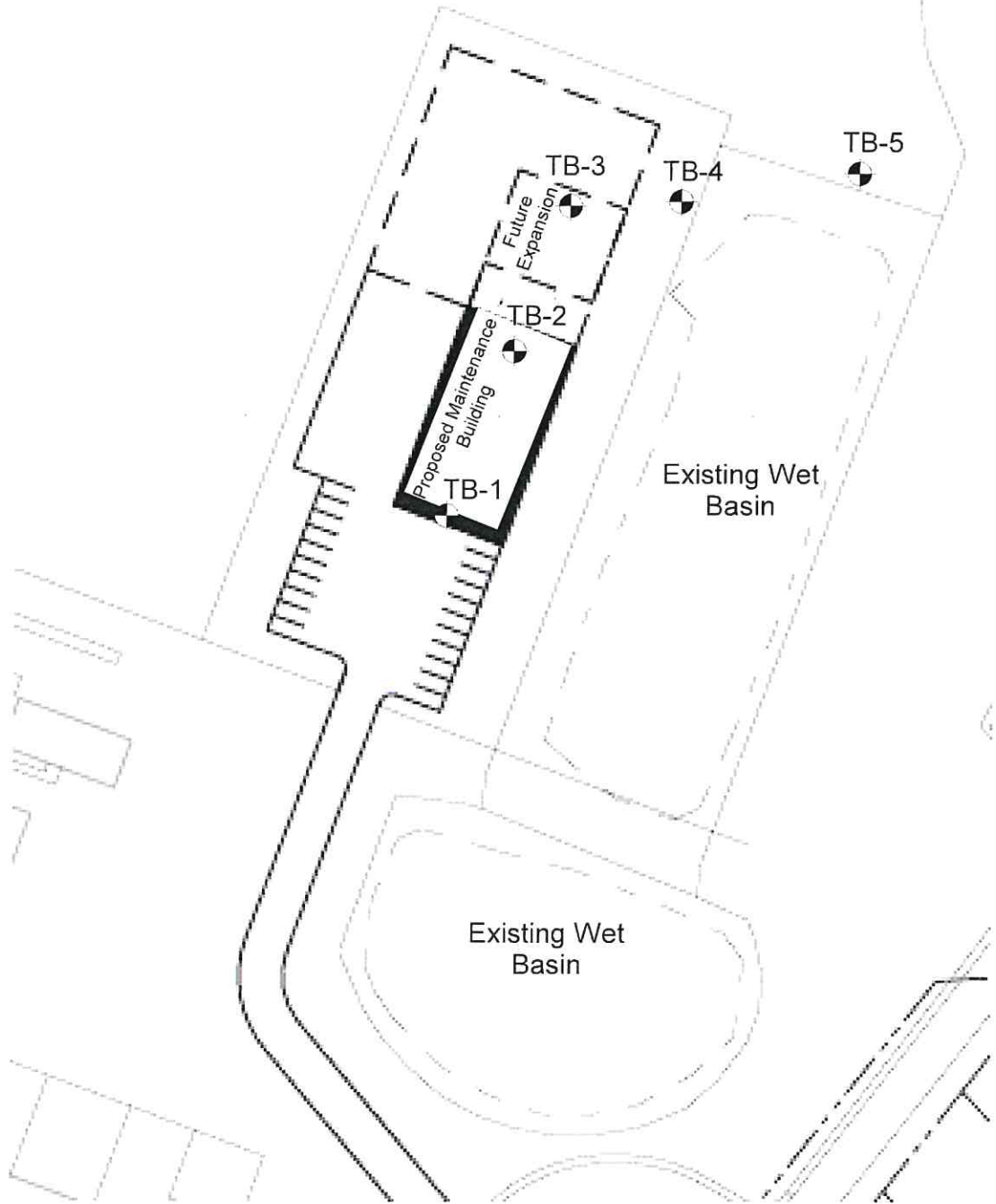
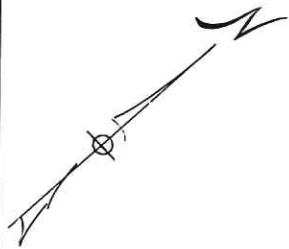
Respectfully submitted,  
**Underwood Engineering Company**



William R. Underwood, P.E.  
President



**Appendix A**  
**Boring Location Plan**



Test Boring Location  T.B.-

Edwards Engineering Group	PROPOSED MAINTENANCE BUILDING 101 South Reeds Road Galloway Township, Atlantic County, NJ			
BORING LOCATION PLAN				
<b>Underwood Engineering Company</b>	Scale: N.T.S.	Date: Dec. 30, 2019	UE Ref. No.: 4628-12571-1	D - 1

**Appendix B**  
**Boring Logs**

CLIENT: Edwards Engineering Group  
 PROJECT: Maintenance Building Geotechnical Invest.  
 101 South Reeds Road  
 Galloway, NJ

**UNDERWOOD ENGINEERING COMPANY**  
 143 Harding Avenue, Bellmawr, NJ 08031  
 Ph.# 856.933.1818 Fx.# 856.933.3121  
 William R. Underwood, P.E., President

DATE: 12/30/2019

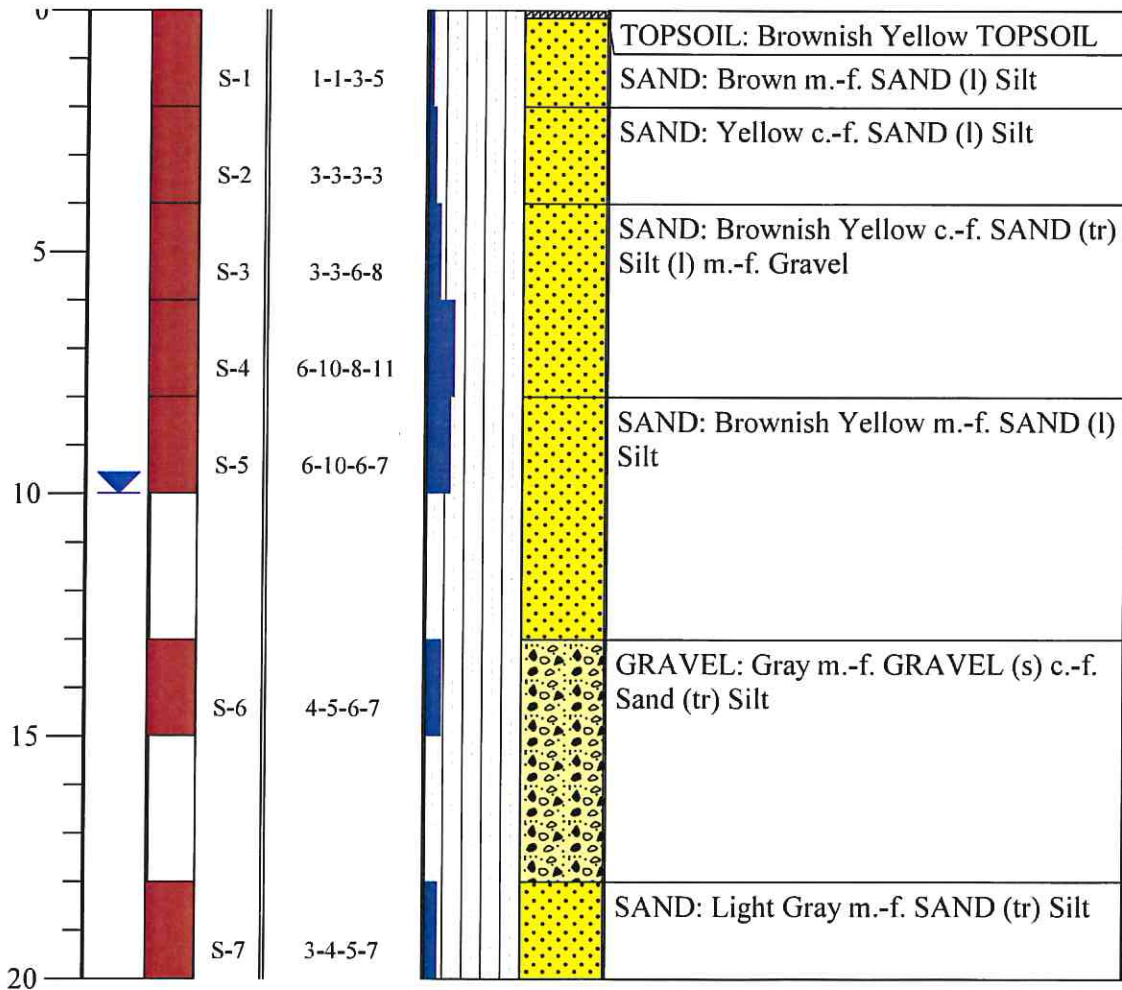
BORING No.: TB-1

GROUND SURFACE ELEVATION: N/A

GROUNDWATER DATA	
DEPTH	Hours After Completion
10'	Sample Saturated with Water

METHOD OF ADVANCING BORING	DEPTH (FT.)
CONTINUOUS SPLIT SPOON SAMPLE	0' to 10'
AUGERS	10' to 18'
2" O.D. SPLIT SPOON	18' to 20'

Depth (ft)	Groundwater	Sampling Interval	Sample #	Blows	N-Values	Lithology	Soil Description*	Notes:



\*FIELD CLASSIFICATION ONLY. SOIL CLASSIFICATION FOR PARTICULAR USES SHOULD BE ASCERTAINED BY LABORATORY TESTS.

CLIENT: Edwards Engineering Group  
 PROJECT: Maintenance Building Geotechnical Invest.  
 101 South Reeds Road  
 Galloway, NJ

<b>UNDERWOOD ENGINEERING COMPANY</b> 143 Harding Avenue, Bellmawr, NJ 08031 Ph.# 856.933.1818 Fx.# 856.933.3121 William R. Underwood, P.E., President
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DATE: 12/30/2019

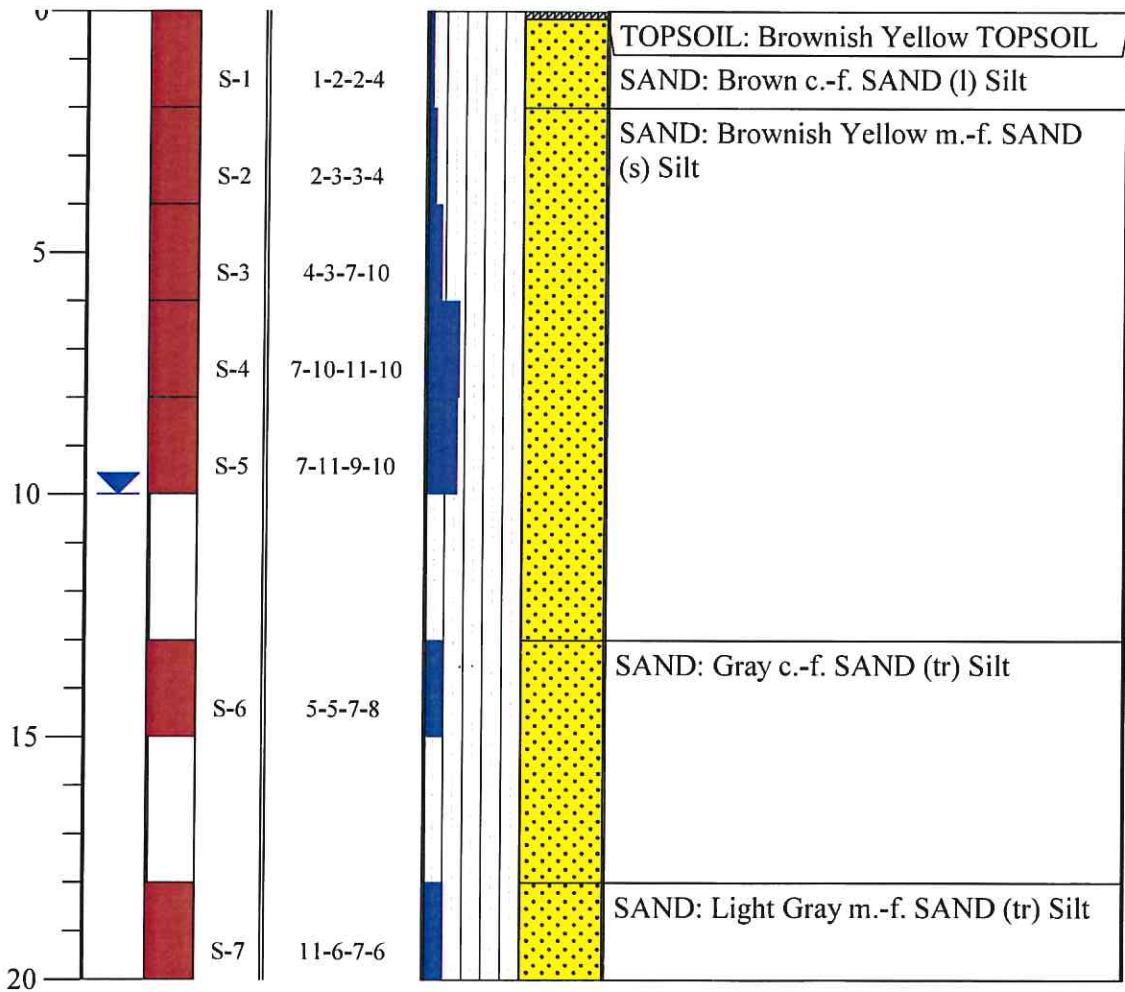
GROUND SURFACE ELEVATION: N/A

BORING No.: TB-2

GROUNDWATER DATA	
DEPTH	Hours After Completion
10'	h Sample Saturated with Water

METHOD OF ADVANCING BORING	DEPTH (FT.)
CONTINUOUS SPLIT SPOON SAMPLE	0' to 10'
AUGERS	10' to 18'
2" O.D. SPLIT SPOON	18' to 20'

Depth (ft)	Groundwater	Sampling Interval	Sample #	Blows	N-Values	Lithology	Soil Description*	Notes:
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\*FIELD CLASSIFICATION ONLY. SOIL CLASSIFICATION FOR PARTICULAR USES SHOULD BE ASCERTAINED BY LABORATORY TESTS.

CLIENT: Edwards Engineering Group  
 PROJECT: Maintenance Building Geotechnical Invest.  
 101 South Reeds Road  
 Galloway, NJ

<b>UNDERWOOD ENGINEERING COMPANY</b> 143 Harding Avenue, Bellmawr, NJ 08031 Ph.# 856.933.1818 Fx.# 856.933.3121 William R. Underwood, P.E., President
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DATE: 12/30/2019

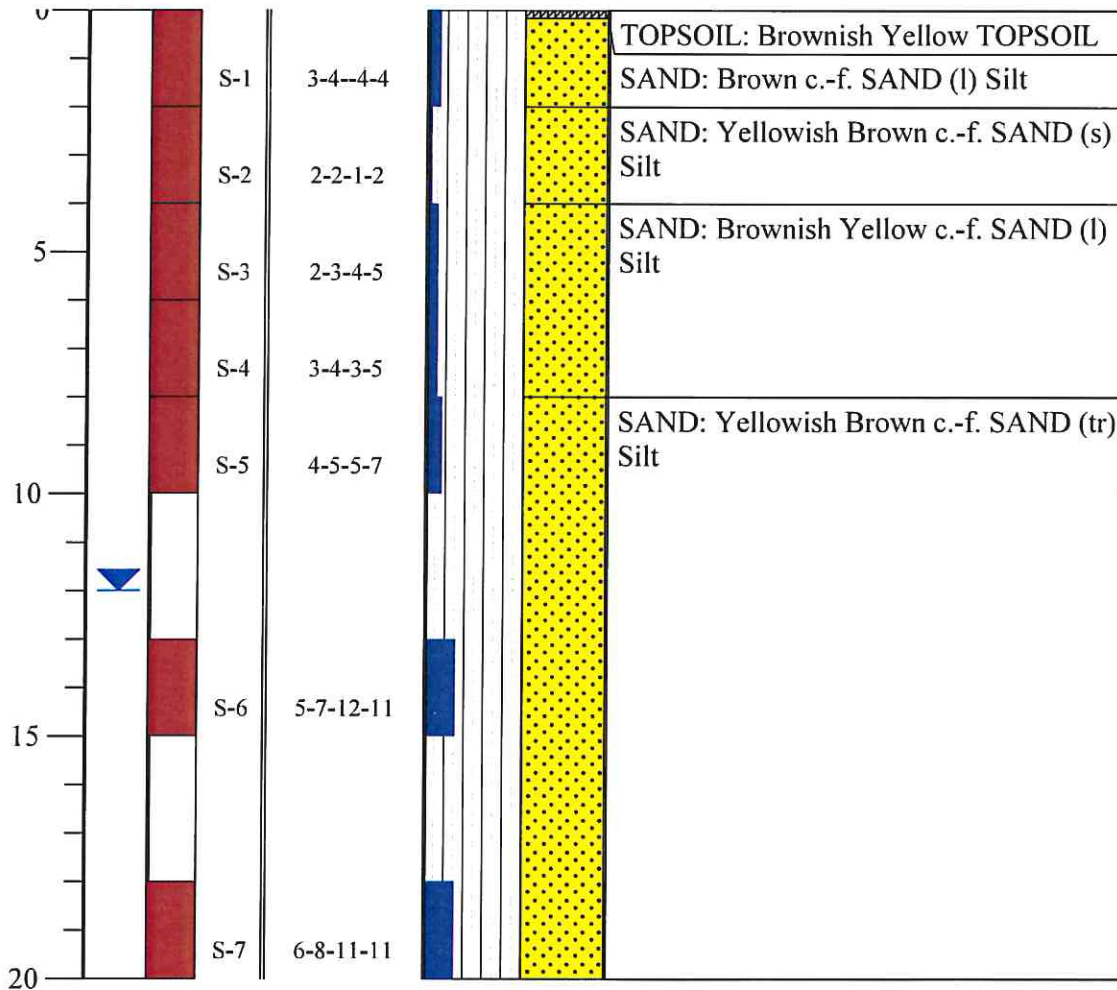
GROUND SURFACE ELEVATION: N/A

BORING No.: TB-3

GROUNDWATER DATA	
DEPTH	Hours After Completion
12'	Sample Saturated with Water

METHOD OF ADVANCING BORING	DEPTH (FT.)
CONTINUOUS SPLIT SPOON SAMPLE	0' to 10'
AUGERS	10' to 18'
2" O.D. SPLIT SPOON	18' to 20'

Depth (ft)	Groundwater	Sampling Interval	Sample #	Blows	N-Values	Lithology	Soil Description*	Notes:
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\*FIELD CLASSIFICATION ONLY. SOIL CLASSIFICATION FOR PARTICULAR USES SHOULD BE ASCERTAINED BY LABORATORY TESTS.

CLIENT: Edwards Engineering Group  
 PROJECT: Maintenance Building Geotechnical Invest.  
 101 South Reeds Road  
 Galloway, NJ

**UNDERWOOD ENGINEERING COMPANY**  
 143 Harding Avenue, Bellmawr, NJ 08031  
 Ph.# 856.933.1818 Fx.# 856.933.3121  
 William R. Underwood, P.E., President

DATE: 12/30/2019

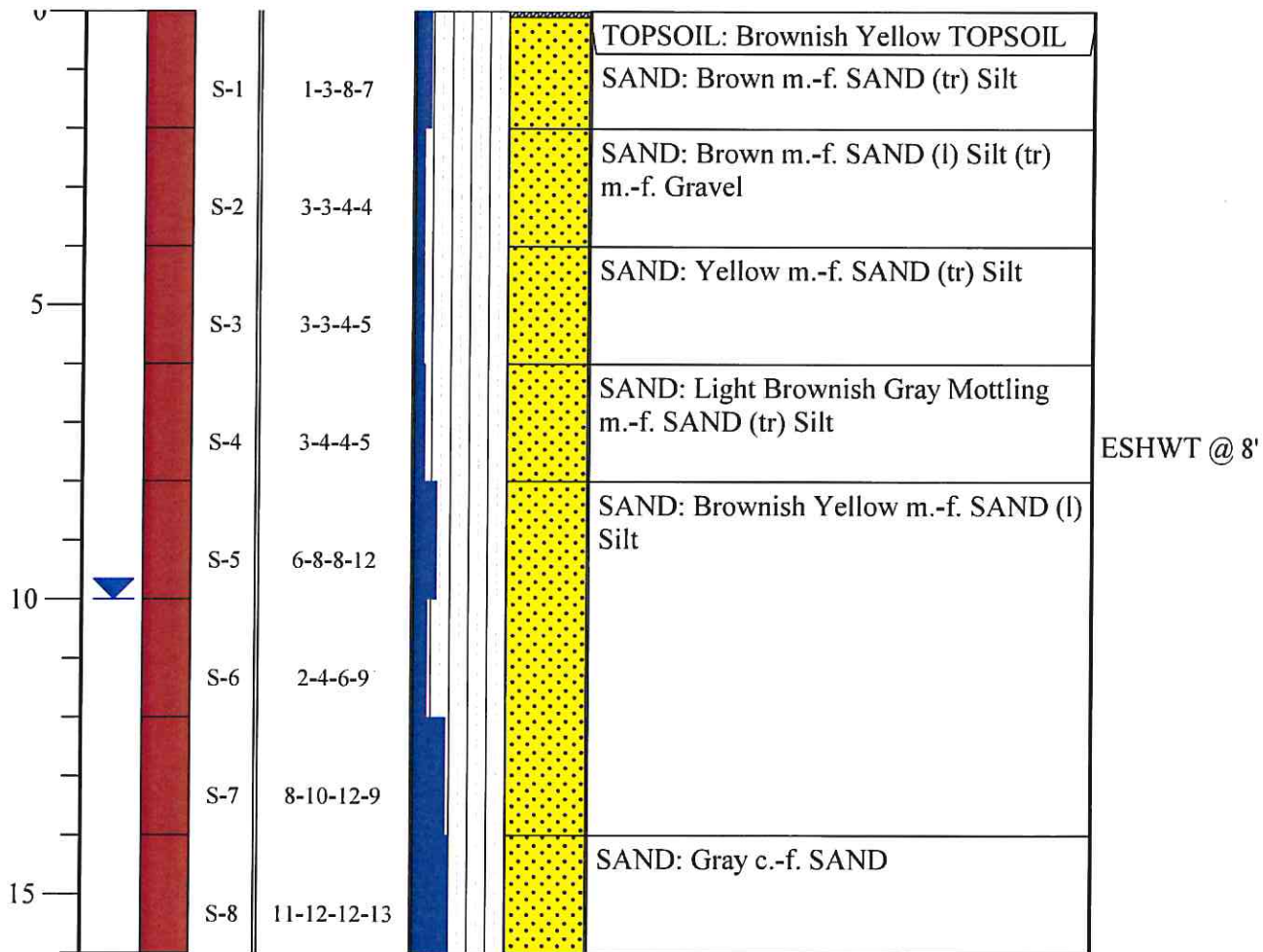
BORING No.: TB-4

GROUND SURFACE ELEVATION: 43.5'

GROUNDWATER DATA	
DEPTH	Hours After Completion
10'	4 Sample Saturated with Water

METHOD OF ADVANCING BORING	DEPTH (FT.)
CONTINUOUS SPLIT SPOON SAMPLE	0' to 14'
AUGERS	N/A
2" O.D. SPLIT SPOON	14' to 16'

Depth (ft)	Groundwater	Sampling Interval	Sample #	Blows	N-Values	Lithology	Soil Description*	Notes:



\*FIELD CLASSIFICATION ONLY. SOIL CLASSIFICATION FOR PARTICULAR USES SHOULD BE ASCERTAINED BY LABORATORY TESTS.



CLIENT: Edwards Engineering Group  
 PROJECT: Maintenance Building Geotechnical Invest.  
 101 South Reeds Road  
 Galloway, NJ

**UNDERWOOD ENGINEERING COMPANY**  
 143 Harding Avenue, Bellmawr, NJ 08031  
 Ph.# 856.933.1818 Fx.# 856.933.3121  
 William R. Underwood, P.E., President

DATE: 12/30/2019

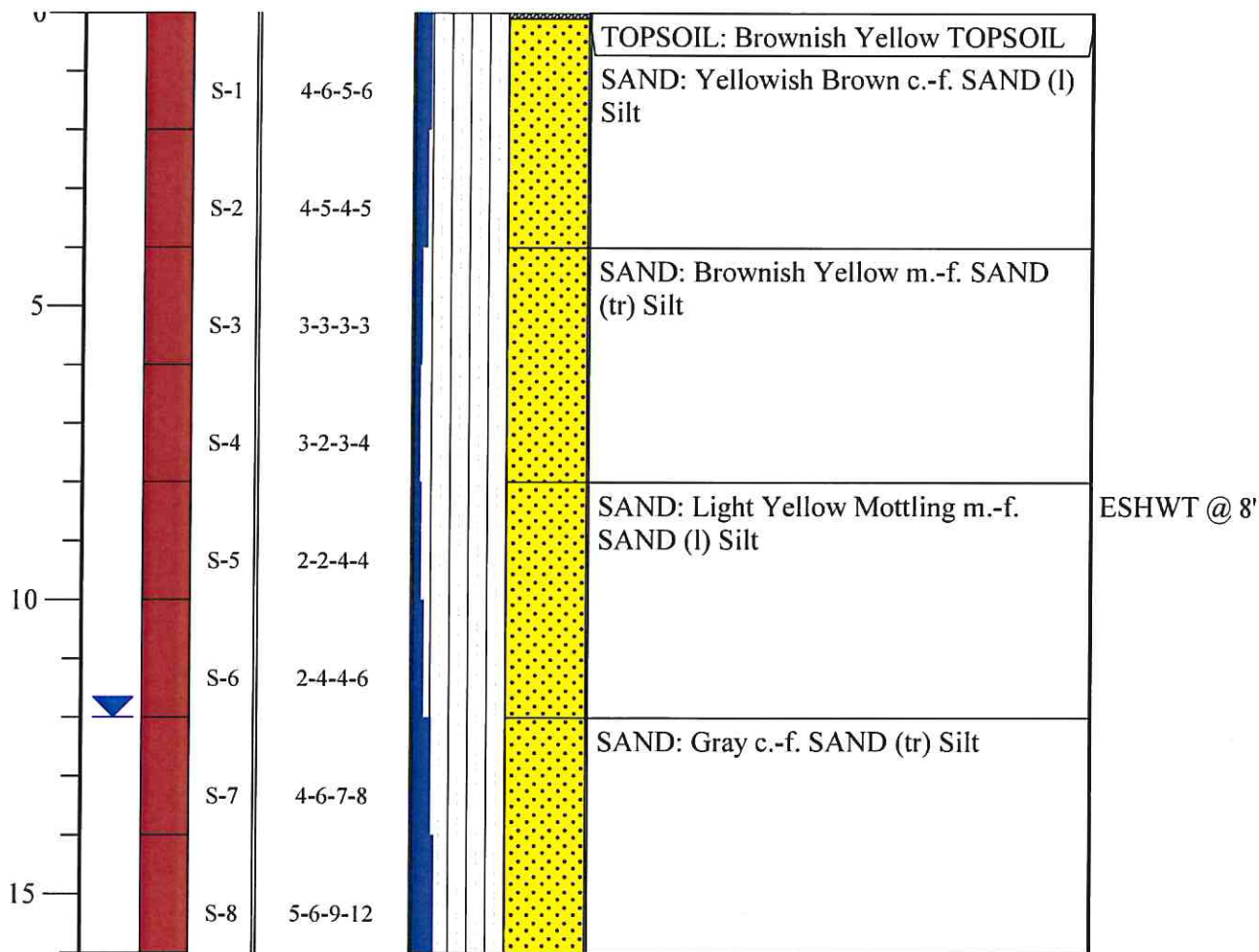
BORING No.: TB-5

GROUND SURFACE ELEVATION: 44.5'

GROUNDWATER DATA	
DEPTH	Hours After Completion
12'	4 Sample Saturated with Water

METHOD OF ADVANCING BORING	DEPTH (FT.)
CONTINUOUS SPLIT SPOON SAMPLE	0' to 14'
AUGERS	N/A
2" O.D. SPLIT SPOON	14' to 16'

Depth (ft)	Groundwater	Sampling Interval	Sample #	Blows	N-Values	Lithology	Soil Description*	Notes:



\*FIELD CLASSIFICATION ONLY. SOIL CLASSIFICATION FOR PARTICULAR USES SHOULD BE ASCERTAINED BY LABORATORY TESTS.

**Appendix C**  
**Mechanical Sieve (Gradation) Analysis Results**



Underwood Engineering, Inc.  
 143 Harding Avenue  
 Bellmawr, NJ 08031  
 856-933-1818 Phone  
 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0154-S01

Issue No: 1

Client: Edwards Engineering CC:

Project: Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

This report is based on the visual and physical inspection described below. The inspection, laboratory tests and subsequent results are based on a representative sample of the overall project. Inspection by Underwood Engineering, Inc. in no way releases the contractor or sub-contractor of full responsibility of meeting contract documents, plans, specifications, shop drawings and standard in the industry. No other warranty is expressed or implied. No conclusions should be drawn from this report other than those specifically stated.



AASHTO  
 ACCREDITED

Submitted By:  
 Date of Issue:

Bill Underwood  
 1/8/2020

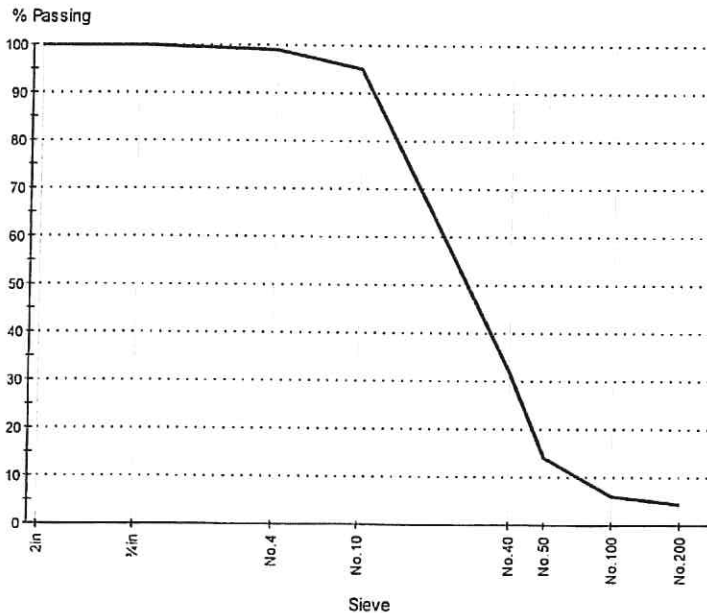
## Sample Details

Sample ID 20-0154-S01  
 Date Sampled 12/30/2019  
 Source Test Boring  
 Specification I-5 plus No. 100 Sieve  
 Location TB5 12' to 14'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	17.4	
Method			B
Tested By		Cait Brevik	
Date Tested		12/30/2019	

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 12/30/2019

Tested By: Cait Brevik

Sieve Size	% Passing	Limits
2in	100	
1/2in	100	
No. 4	99	
No. 10	95	
No. 40	32	
No. 50	14	
No. 100	6	
No. 200	4.4	

## Comments

Light Gray c.f. SAND (tr) f. Gravel (tr) Silt & Clay



Underwood Engineering, Inc.  
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 Bellmawr, NJ 08031  
 856-933-1818 Phone  
 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0154-S03

Issue No: 1

**Client:** Edwards Engineering **CC:**  
**Project:** Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

This report is based on the visual and physical inspection described below. The inspectors, laboratory tests and subsequent results are based on a representative sample of the overall project. Inspection by Underwood Engineering, Inc. in no way releases the contractor or sub-contractor of full responsibility of meeting contract documents, plans, specifications, shop drawings and standard in the industry. No other warranty is expressed or implied. No conclusions should be drawn from this report other than those specifically stated.



**Submitted By:**  
**Date of Issue:**

Bill Underwood  
 1/8/2020

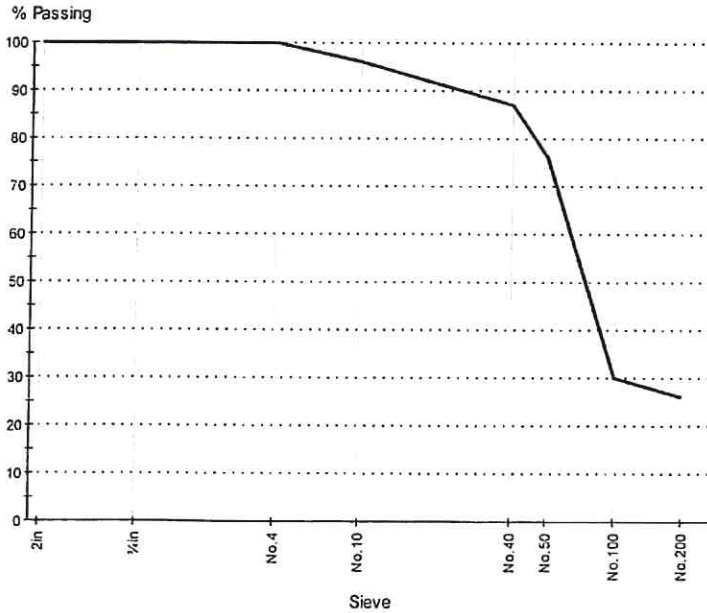
## Sample Details

**Sample ID** 20-0154-S03  
**Date Sampled** 12/30/2019  
**Source** Test Boring  
**Specification** I-5 plus No. 100 Sieve  
**Location** TB3 4' to 6'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	5.0	
Method			B
Tested By		Cait Brevik	
Date Tested		12/30/2019	

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 12/30/2019

Tested By: Cait Brevik

Sieve Size	% Passing	Limits
2in	100	
1/2in	100	
No. 4	100	
No. 10	96	
No. 40	87	
No. 50	76	
No. 100	30	
No. 200	26	

## Comments

Yellow c.f. SAND (s) Silt & Clay (tr) f. Gravel



Underwood Engineering, Inc.  
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 Bellmawr, NJ 08031  
 856-933-1818 Phone  
 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0154-S02

Issue No: 2

Client: Edwards Engineering CC:

Project: Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

This report is based on the visual and physical inspection described below. The inspection, laboratory tests and subsequent results are based on a representative sample of the overall project. Inspection by Underwood Engineering, Inc. in no way releases the contractor or sub-contractor of full responsibility of meeting contract documents, plans, specifications, shop drawings and standard in the industry. No other warranty is expressed or implied. No conclusions should be drawn from this report other than those specifically stated.



AASHTO  
 A C C R E D I T E D

Submitted By:

Bill Underwood

Date of Issue:

1/8/2020

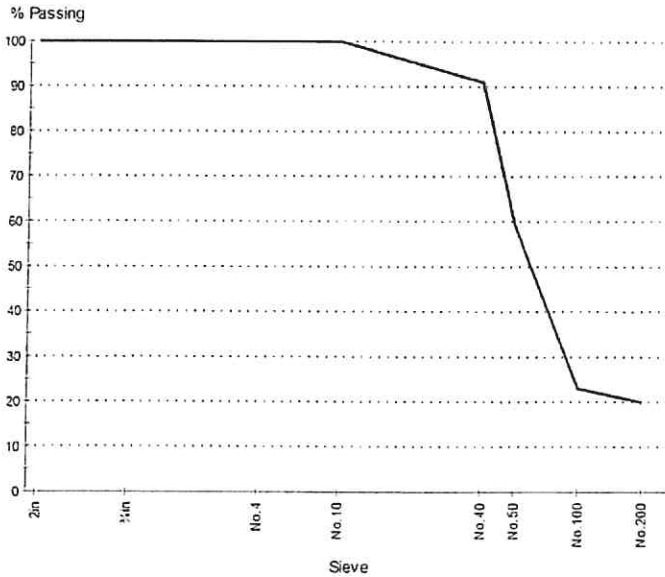
## Sample Details

Sample ID 20-0154-S02  
 Date Sampled 12/30/2019  
 Source Test Boring  
 Specification I-5 plus No. 100 Sieve  
 Location TB4 10' to 12'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	14.3	
Method			B
Tested By			Cait Brevik
Date Tested			12/30/2019

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 12/30/2019

Tested By: Cait Brevik

Sieve Size	% Passing	Limits
2in	100	
1/2in	100	
No. 4	100	
No. 10	100	
No. 40	91	
No. 50	59	
No. 100	23	
No. 200	20	

## Comments

Light Gray m.f. SAND (I) Silt & Clay (tr) f. Gravel



Underwood Engineering, Inc.  
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 Bellmawr, NJ 08031  
 856-933-1818 Phone  
 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0154-S04

Issue No: 1

**Client:** Edwards Engineering **CC:**  
**Project:** Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

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AASHTO  
ACCREDITED

Submitted By:  
Date of Issue:

Bill Underwood  
1/8/2020

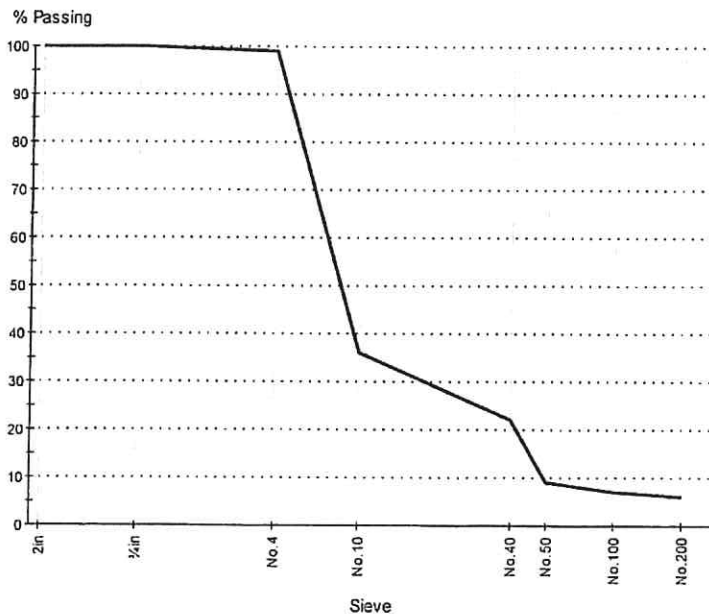
## Sample Details

**Sample ID** 20-0154-S04  
**Date Sampled** 12/30/2019  
**Source** Test Boring  
**Specification** I-5 plus No. 100 Sieve  
**Location** TB1 13' to 15'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	20.6	
Method			B
Tested By		Cait Brevik	
Date Tested		12/30/2019	

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 12/30/2019

Tested By: Cait Brevik

Sieve Size	% Passing	Limits
2in	100	
3/4in	100	
No.4	99	
No.10	36	
No.40	22	
No.50	9	
No.100	7	
No.200	5.9	

## Comments

Gray m.f. GRAVEL (s) c.f. Sand (tr) Silt & Clay



Underwood Engineering, Inc.  
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 Bellmawr, NJ 08031  
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 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0169-S01

Issue No: 1

**Client:** Edwards Engineering **CC:**  
**Project:** Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

This report is based on the visual and physical inspection described below. The inspectors, laboratory tests and subsequent results are based on a representative sample of the overall project. Inspection by Underwood Engineering, Inc. in no way releases the contractor or sub-contractor of full responsibility of meeting contract documents, plans, specifications, shop drawings and standard in the industry. No other warranty is expressed or implied. No conclusions should be drawn from this report other than those specifically stated.



**AASHTO**  
 ACCREDITED  
 Submitted By:  
 Date of Issue:

Bill Underwood  
 1/8/2020

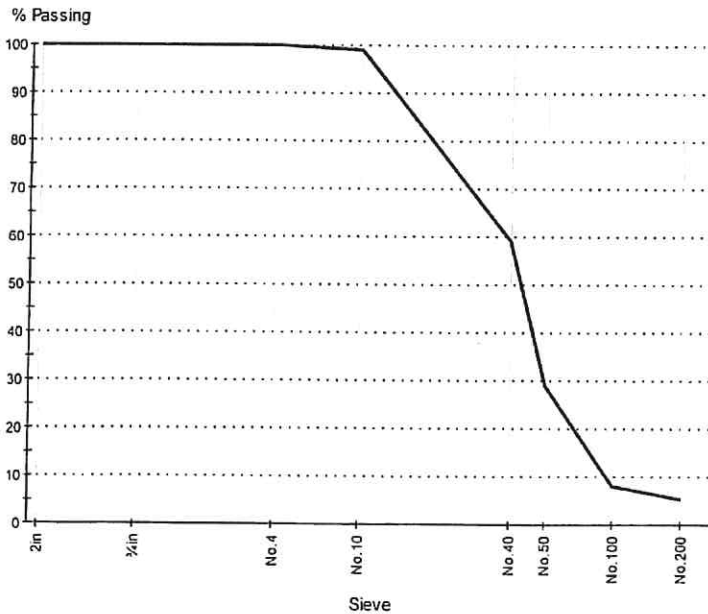
## Sample Details

**Sample ID** 20-0169-S01  
**Date Sampled** 1/6/2020  
**Source** Test Boring  
**Specification** I-5 plus No. 100 Sieve  
**Location** TB5 @ 13'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	18.2	
Method			B
Tested By			Ted Crook
Date Tested			1/6/2020

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 1/6/2020

Tested By: Ted Crook

Sieve Size	% Passing	Limits
2in	100	
3/4in	100	
No. 4	100	
No. 10	99	
No. 40	59	
No. 50	29	
No. 100	8	
No. 200	5.3	

## Comments

Gray c.f. SAND (tr) Silt & Clay (tr) f. Gravel



Underwood Engineering, Inc.  
 143 Harding Avenue  
 Bellmawr, NJ 08031  
 856-933-1818 Phone  
 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0169-S01

Issue No: 1

Client: Edwards Engineering CC:  
 Project: Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

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Submitted By:  
 Date of Issue:

Bill Underwood  
 1/8/2020

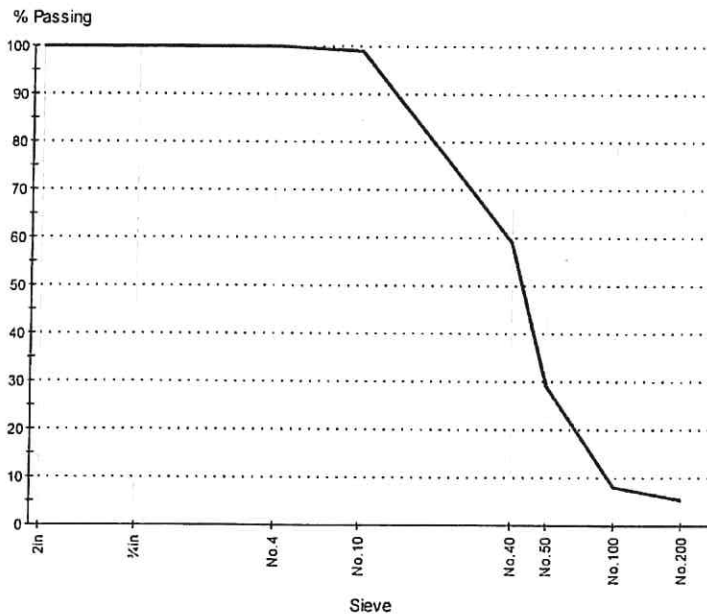
## Sample Details

Sample ID 20-0169-S01  
 Date Sampled 1/6/2020  
 Source Test Boring  
 Specification I-5 plus No. 100 Sieve  
 Location TB5 @ 13'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	18.2	
Method			B
Tested By			Ted Crook
Date Tested			1/6/2020

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 1/6/2020

Tested By: Ted Crook

Sieve Size	% Passing	Limits
2in	100	
3/4in	100	
No.4	100	
No.10	99	
No.40	59	
No.50	29	
No.100	8	
No.200	5.3	

## Comments

Gray c.f. SAND (tr) Silt & Clay (tr) f. Gravel





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 856-933-3121 Fax

# Material Test Report

Report No: MAT:20-0169-S02

Issue No: 1

Client: Edwards Engineering CC:

Project: Maintenance Bldg Geo  
 101 South Reeds Road, Galloway, NJ

This report is based on the visual and physical inspection described below. The inspectors, laboratory tests and subsequent results are based on a representative sample of the overall project. Inspection by Underwood Engineering, Inc. in no way releases the contractor or sub-contractor of full responsibility of meeting contract documents, plans, specifications, shop drawings and standard in the industry. No other warranty is expressed or implied. No conclusions should be drawn from this report other than those specifically stated.



AASHTO  
 ACCREDITED  
 Submitted By:  
 Date of Issue:

Bill Underwood  
 1/8/2020

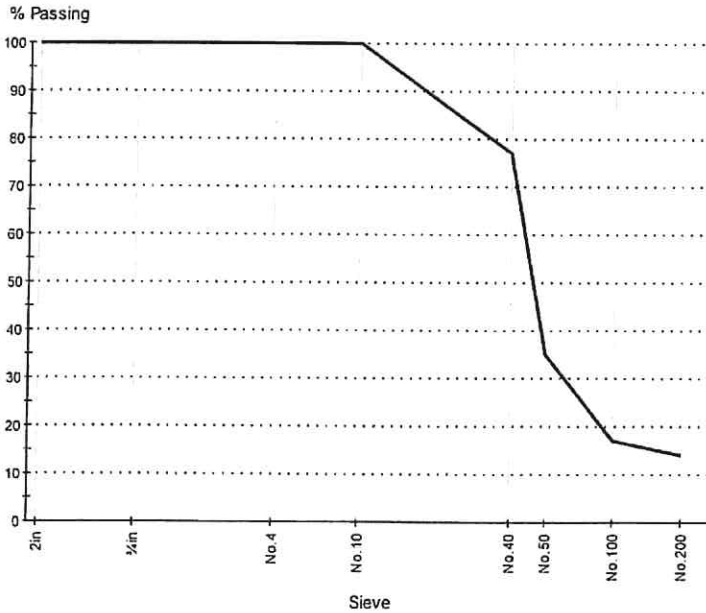
## Sample Details

Sample ID 20-0169-S02  
 Date Sampled 1/6/2020  
 Source Test Boring  
 Specification I-5 plus No. 100 Sieve  
 Location TB4 @ 10'

## Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	15.2	
Method			B
Tested By		Ted Crook	
Date Tested		1/6/2020	

## Particle Size Distribution



Method: AASHTO T 27, AASHTO T 11

Drying by: Oven

Date Tested: 1/6/2020

Tested By: Ted Crook

Sieve Size	% Passing	Limits
2in	100	
3/4in	100	
No. 4	100	
No. 10	100	
No. 40	77	
No. 50	35	
No. 100	17	
No. 200	14	

## Comments

Yellow m.f. SAND (I) Silt & Clay

**Appendix D**  
**General Soil Terms**

### General Soil Terms

Particle Sizes		Classifications
Boulders	Greater than 2 inches (305mm)	The major soil constituent is the principal noun, i.e. clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:
Cobbles	3 inches (76.233) to 12 inches (305mm)	
Gravel-coarse	3/4 inches (19.05mm) to 3 inches (76.2mm)	
Gravel-fine	No. 4- 3/16 inches (4 75mm) to 3/4 inches (19.05mm)	
Sand-coarse	No. 10 (2.00mm) to No. 4 (4 75mm)	Second Major Constituent-Minor Constituents (Percentage by weight)
Sand-medium	No. 40 (0.425mm) to No. 10 (2.00.)	
Sand-fine	No. 200 (0.075mm) to No. 40 (0.425mm)	
Silt	0.005mm to 0.074mm	Trace – 1 to 12%
Clay	Less than 0.005mm	Adjective – 12 to 35% (clayey, silty, etc.)
		Trace – 1 to 12%
		Little – 12 to 23
		Some – 23 to 33%
		And – Over 35%

### Cohesive Soils

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with other major soil constituent as modifier: i.e. silty clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils: i.e. silty clay, trace of sand, little gravel

### Unconfined Compressive Strength (psf)

Consistency		Approximate Range of (N)
Very Soft	Below 500	0-2
Soft	500-1000	3-4
Medium	1000-2000	5-8
Stiff	2000-4000	9-15
Very Stiff	4000-8000	16-30
Hard	8000-16000	31-50
Very Hard	Over 16000	Over 50

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon Standard Penetration Resistance (N)

### Cohesionless Soils

Density Classification	Relative Density	Approximate Range of (N)
Very Loose	0-15	0-4
Loose	16-35	5-10
Medium Compact	36-65	11-30
Compact	66-85	31-50
Very Compact	86-100	Over 50

Relative Density of Cohesionless Soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

Standard Penetration Test (ASTM D 1586) – A 2.0" outside-diameter split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).

**Appendix E**  
**Important Information about Your Geotechnical Engineering Report-ASFE**

## GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS, AND PROJECTS

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely to the client. No one except you should rely on your geotechnical engineering report without first conferring with the GEOTECHNICAL engineer who prepared it. And no one—not even you should apply the report for any purpose or project except the one originally contemplated.

## A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and the other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- \*not prepared for you,
- \*not prepared for your project,
- \*not prepared for the specific site explored, or
- \*completed before important project changes were made

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- \*the function of the proposed structure, as when its changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse
- \*elevation, configuration, location, orientation, or weight off the proposed structure,
- \*composition of the design team, or
- \*project ownership

As a general rule, always inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

## SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the study was performed. Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

#### **MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINIONS**

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

#### **A REPORT'S RECOMMENDATIONS ARE NOT FINAL**

Do not over rely on the construction recommendations included in your report. Those recommendations are not final, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

#### **A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

#### **DO NOT REDRAW THE ENGINEER'S LOGS**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

#### **GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE**

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer.

A prebid conference can also be valuable. Be sure contractors have sufficient time to perform additional studies. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

#### READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled “limitations”, many of these provisions indicate where geotechnical engineers responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

#### GEOENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques and personnel used to perform a geoenvironmental study differ significantly from those used to perform a geotechnical study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated environmental problems have led to numerous project failures. If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. Do not rely on an environmental report prepared for someone else.

**PART 2 - GENERAL CONSTRUCTION WORK**



## SECTION 02000 – SITE WORK

---

### 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 WORK COVERED BY CONTRACT DOCUMENTS (SITE WORK)

- A. The work generally consists of:
  1. Site clearing and phased demolition as required for the proposed construction.
  2. Construction of new utilities including storm drainage systems, sanitary systems, water systems, gas, electric, and site lighting.
  3. Construction of parking lots, sidewalks, curbing, fencing, signs, etc...
  4. Other site work as indicated on the Construction Plan Set.
  5. Landscape plantings and the spreading of topsoil, seeding, & mulching as required.
  6. Enlargement of an existing storm water management (wet) pond.
  7. Control of access to the construction and staging areas, and construction traffic control.
  8. Control of soil erosion and sediment during the term of the contract or until permanent ground cover has been established.
  9. Engage a certified materials testing and inspection company to verify that the construction materials and procedures related to all site work (including; pavements, walls, utilities, and related appurtenances) in the project, meet or exceed the project specifications.
  10. Engage a licensed geotechnical (soils) engineer to dictate the soil compaction measures used to prepare subgrade soils for site work. The geotechnical engineer shall also review the soil compaction test reports prepared by the materials testing and inspection company and must certify that all specifications have been met. This requirement applies to all pavement and parking lot areas, concrete slabs, utility trenches, and foundations.
  11. Final cleanup, owner walk through and punch list.
  12. Coordinate with local gas and water utility companies for installation of new services to the building.

#### 1.3 CONTRACTOR USE OF PREMISES AND LOGISTICS

- A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the work is indicated.
  1. The Contractor shall provide all temporary signage for traffic control, access, and safety requirements.
  2. The Contractor shall maintain site access at all times to the Owner's facilities, including, but not limited to adjacent roads, driveways, and receiving areas.
  3. Owner Occupancy: Allow for Owner occupancy and use by the public as permitted by the Owner. Coordinate with the Owner in this regard.

4. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

#### **1.4 CONTROL OF THE WORK AND STORAGE AREAS**

- A. The construction area shall be enclosed by temporary construction fencing.
- B. Gate locations for the temporary fencing shall be coordinated with the owner. Gates may be moved throughout construction as needed by the Contractor. All associated costs shall be included in the contract. All gates shall be secured after working hours by security locks or other means acceptable to the Owner. During working hours, the work and staging areas shall remain open as little as practicable. The contractor will provide all padlocks and keys to secure all construction gates and provide copies of keys to Owner's representative.
- C. The contractor may move construction fencing as needed to provide clearance for the work, however, the site shall be secured from public trespass at all times.
- D. The Contractor shall periodically inspect the security measures to insure they function properly and that unauthorized persons, particularly children, are effectively prohibited from gaining entry or from coming into contact with hazardous site features.
- E. The Contractor shall regularly walk the perimeter of the site and inspect the condition and safety of the existing and temporary construction fence. Any sharp edges, loose parts, burrs, or other potentially harmful components shall be repaired/modified to a safe condition.

**END OF SECTION 02000**

## **SECTION 02050 – FIELD ENGINEERING**

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### **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. General: This Section specifies administrative and procedural requirements for field-engineering services including, but not limited to, the following:
  - 1. Land survey work.
  - 2. Engineering support for various aspects of construction.
  - 3. Materials Testing and Inspection for site work.
  - 4. Geotechnical Engineering Services
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section "Coordination" for procedures for coordinating field engineering with other construction activities.
  - 2. Division 1 Section "Submittals" for submitting Project record surveys.
  - 3. Division 1 Section "Project Closeout" for submitting final property survey with Project Record Documents and recording of Owner-accepted deviations from indicated lines and levels.

#### **1.3 SUBMITTALS**

- A. Certificates: Submit an as-built survey prepared and signed by the land surveyor certifying the final location and elevation of improvements.
- B. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of "Submittals" and "Project Closeout" Sections.
- C. Furnish signed and sealed shop drawings for any site work component that requires additional engineering (i.e. modular block retaining walls, fencing support systems, shoring & bracing).

#### **1.4 QUALITY ASSURANCE**

- A. Surveyor Qualifications: Engage a land surveyor, registered in the State of New Jersey, to perform required land-surveying services.
- B. Engineer Qualifications: Engage an engineer of the discipline required; licensed in the State of New Jersey, to perform required engineering services for shop drawings and other construction related work requiring an engineering certification.
- C. Materials Testing & Inspections: Engage a certified materials testing and inspection company to perform daily inspections and materials testing as required herein. The company shall possess requisite NJ DPMC and NJ SDA pre-qualifications for work required in this project.

- D. Engage a Geotechnical (soils) engineer to oversee and certify the backfilling and compaction of subgrade soils within structural areas of the project, including, but not necessarily limited to; pavement areas, concrete slabs and pedestrian walkways, foundations, light pole bases, and related construction. This work does not apply to the IBC “Special Inspections” related to the building footprint and land within 5 feet thereof (unless a foundation related to site or utility work is located within said 5 foot distance).
- E. Engage an underground utility mark out company to mark the location of all buried utilities within the limit of disturbance and within 25 feet thereof. Prior to the commencement of demolition work, excavate test pits to verify the size, depth and alignment of all utilities found within proposed work areas. Report any conflicts to the Architect for instructions via the Request For Information (RFI) process.

## **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 – EXECUTION**

### **3.1 EXAMINATION**

- A. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks, 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.
- B. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction.
  - 1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping.
- C. The Contractor’s certified materials testing and inspection company shall oversee all site work on a daily basis, document the placement of materials and progress of site construction, prepare daily reports, and perform materials testing on soil aggregates, subgrades, pavements, miscellaneous poured-in-place concrete site improvements, and storm and sanitary sewer appurtenances.
  - 1. The inspection and testing of all storm and sanitary sewer construction shall verify that all work meets or exceeds the construction and materials requirements set forth in applicable sections of the project specifications and construction plans. As a minimum, this includes the depth and composition of pipe bedding & trench backfill, pipe materials, pipe joints & fittings, construction of sewer chambers, and other ancillary work.
  - 2. All asphalt and Portland cement concrete pavements, subbases, and subgrades shall be inspected for material composition, density, thickness, and strength to verify conformance with applicable sections of the specifications and construction plans.

### **3.2 PERFORMANCE**

- A. Work from lines and levels established by the design drawings. Establish benchmarks and markers to set lines and levels at each story 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 Owner's Representative, when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
  - 2. On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.
  
- C. Site Improvements: Locate and lay out site improvements, including the building, exterior enclosures, curbs, fencing, walls, pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.
  - 1. Detailed spot elevations are provided on the Site Grading Plan to insure that all sidewalks, stairs, landings, and ramps comply with applicable codes. These spot grades shall be used by the land surveyor when establishing control for the work. Note specific and detailed grading has been provided for sidewalk and ADA crossings along the public right of way. This work requires a high degree of construction accuracy and quality control checking during construction. The maximum slopes shown on the plans shall not be exceeded.
  
- 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. The Contractor's Land surveyor and/or Engineer shall submit a Request For Information (RFI) to the Owner, if there is any conflicting plan information or confusion over the design intent. This includes a design element that looks out of place, a spot elevation that bucks the grading trend, or a number that appears to be juxtaposed or otherwise incorrect.

**END OF SECTION 02050**

## **SECTION 02100 – SELECTIVE DEMOLITION**

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### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. The phased demolition and removal of selected site elements. Refer to plans for additional demolition notes and requirements. Maintain surface conditions as long as possible before demolishing same to prevent soils from becoming saturated and damaged.
  - 2. Perform underground utility mark out before proceeding with any demolition work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 2 Section "Summary of Work" for use of the building and phasing requirements.
  - 2. Division 2 Section "Contract Closeout" for record document requirements.
  - 3. Division 2 Section "Site Clearing" for site clearing and removing above- and below-grade improvements.
  - 4. Division 2 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.

#### **1.3 DEFINITIONS**

- A. Demolish: Completely remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area. Note that the designated storage area may be in another location within the municipality.
- C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse (replace missing hardware); store and protect against damage. Reinstall items in the same locations or in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Owner, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

## **1.4 MATERIALS OWNERSHIP**

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

## **1.5 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.
- B. Proposed dust-control measures.
- C. Proposed noise-control measures.
- D. Schedule of selective demolition activities indicating the following:
  - 4. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
- E. Inventory of items to be removed and salvaged.
- F. Inventory of items to be removed by Owner.
- G. Photographs or video recordings, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
- H. Record drawings at Project closeout according to Division 1 Section "Contract Closeout."
  - 1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

## **1.6 QUALITY ASSURANCE**

- A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition Work similar to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Pre-Demolition Conference: Conduct conference at Project site to comply with preinstallation

conference requirements of Division 1 Section "Project Meetings."

### **1.7 PROJECT CONDITIONS**

- A. Storage or sale of removed items or materials on-site will not be permitted.

### **1.8 SCHEDULING**

- A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

### **1.9 WARRANTY**

- A. Existing Special Warranty: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

## **PART 2 - PRODUCTS (Not Applicable)**

### **2.1 REPAIR MATERIALS**

- A. Use repair materials identical to existing materials.
  - 1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 2. Use materials whose installed performance equals or surpasses that of existing materials.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Owner or Owners representative.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.



### 3.2 UTILITY SERVICES

- A. Maintain all remaining existing utilities, as required, for the connection to the required new utility connections indicated in the documents. Protect against damage during selective demolition operations.
  - 1. Do not interrupt existing utilities serving adjacent properties during work. Provide temporary services during new construction work to existing utilities, as acceptable to Owner and to governing authorities.
  - 2. Utility Requirements: Confirm with local water, electric, and gas utilities, prior to the commencement of selective demolition work that all utilities are properly located and marked out.
  - 3. Engage the services of a private underground utility mark out company to locate all utilities within the limit of disturbance and at least 25 feet beyond in all directions (when accessible).
    - a. The Owner reports the presence of a fiber optic cable running in the lawn area between the Reeds Road School driveway and storm water management areas, where the new driveway will be constructed. Locate and protect the cable. Perform a test pit to verify the depth of the cable and inform the Architect/Owner if the cable will interfere with new construction.

### 3.3 PREPARATION

- A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide detouring signs and barricades as needed to define alternate routes around closed or obstructed sidewalks and roadways as required by the local police department and County of Bergen as applicable.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
  - 1. Protect existing site improvements, appurtenances, and landscaping to remain.
  - 2. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
  - 3. Strengthen or add new supports when required during progress of selective demolition.
- D. Trees around the perimeter of the detention basin must be demolished to enlarge the basin. Only demolish trees that are noted to be demolished. Make every attempt to protect and save all other trees and only demolish if the tree cannot be saved with reasonable assurances that it will thrive. Consult with arborist to determine the extent to which tree roots and branches may be pruned, and demolish the tree if pruning is too severe.

### **3.4 POLLUTION CONTROLS**

- A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
  - 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.
- D. Maintain dust control screening around all fencing that surrounds the construction site at all times.

### **3.5 SELECTIVE DEMOLITION**

- A. Phase the demolition of existing construction so that the site and adjacent areas are kept in a safe and uniform condition. The intent of the demolition limit is for work to be taken to the nearest control joint, but not less than the extent of demolition shown. If a control joint is not present on or beyond four (4) feet of the indicated demolition limit, then sawcut at the designated location. New work shall be constructed to the limit of demolition. Use methods required to complete Work within limitations of governing regulations.
  - 1. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
  - 2. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
- B. 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.
- C. The plans define demolition areas with a hatch as shown in the legend. Demolish all surfaces and structural elements within the hatched area down to subgrade. Protect city-owned improvements such as street signs, light posts, junction boxes, and traffic signal control boxes, unless noted otherwise. Protect utility-owned improvements, unless permission has been obtained to demolish same.

### **3.6 PATCHING AND REPAIRS**

- A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Install temporary pavement patches over utility trenches and other areas where surfacing has been removed and maintain the temporary patch until permanent pavements are installed. Temporary patches will not be permitted in roadways. In roadways, construct permanent pavement repair upon completion of the related work,

### **3.7 DISPOSAL OF DEMOLISHED MATERIALS**

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials, not to be re-used, off of Owner's property and legally dispose of them.

### **3.8 SELECTIVE DEMOLITION SCHEDULE**

- A. Remove and salvage the following:
  - 1. Existing signage, as coordinated w/ owner of signage.
  - 2. Existing on-site utility poles, as coordinated w/ owner of pole.
  - 3. Existing utility-owned street lighting, only after new decorative street lighting is operational.
  - 4. All existing features to be removed shall be coordinated with owner prior to removal from site.

**END OF SECTION 02100**

## **SECTION 02110 – SITE CLEARING**

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### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Topsoil stripping.
  - 2. Removing at-grade improvements.

#### **1.3 PROJECT CONDITIONS**

- A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, parking lots, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from Owner and without proper detouring measures (both pedestrian & traffic) in place.
- B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.
  - 1. Protect improvements on adjoining properties and on Owner's property.
  - 2. Restore damaged improvements to their original condition, as acceptable to property owners.

#### **1.4 EXISTING SERVICES**

- A. General: Existing storm and sanitary sewer services exist. Locate and protect from damage. The Owner reports the presence of a fiber optic cable running in the lawn area along the Reeds Road School driveway. Locate and protect this cable from damage.
- B. Verify location of on-site sanitary sewer and gas are in suitable condition for the new project.

### **PART 2 - PRODUCTS (Not Applicable)**

#### **2.1 TEMPORARY PATCH**

- A. Temporary pavement patch shall be HMA 9.5M64 (or FABC-1 Marshall Mix) bituminous pavement, 2" thick, atop 4" DGA subbase per specification section 02400.

## **PART 3 - EXECUTION**

### **3.1 SITE CLEARING**

- A. General: Remove grass, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
  
- B. Topsoil: Topsoil is defined as friable clay loam surface soil containing humus. This project requires the installation of topsoil in proposed lawn areas across the entire site at a depth of not less than 4 inches (100 mm).
  - 1. Strip topsoil to whatever depths are encountered or as determined by the soils engineer in a manner to prevent intermingling with underlying subsoil or other objectionable or unsuitable material(s). Remove heavy growths of grass and vegetation from areas before stripping and dispose of grass, vegetation and root mass off site in a legal manner. Review the Landscaping Plan (and Site & Grading Plans for adjacent off-site areas) and determine the amount of topsoil needed for the completion of the project. Stockpile a sufficient quantity of screened clean topsoil in accordance with the drawings, general provisions of the contract, and the standards of Soil Erosion and Sediment Control in New Jersey, latest revision. Confirm stockpile location with the engineer and owner and insure the topsoil location does not interfere with future work.
    - a. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
  - 2. Stockpile topsoil in storage piles in area(s) indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles, if required, to prevent wind erosion.
    - a. Relocate the topsoil pile, if needed, as many times as necessary to accommodate site construction. Install soil erosion measures on and around the new pile location as per plan details and notes.
  - 3. Dispose of unsuitable or excess topsoil as specified for disposal of waste material.
  
- C. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.

### **3.2 DISPOSAL OF WASTE MATERIALS**

- A. Burning on Owner's Property: Burning is not permitted on Owner's property.
  
- B. Removal from Owner's Property: Contractor to remove waste materials, all excess suitable fill and topsoil from Owner's property.

**END OF SECTION 02110**

## SECTION 02200 - EARTHWORK

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### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Preparing and grading subgrades to achieve the lines and grades indicated on the Site Grading Plan.
  - 2. Excavating and backfilling, including imported controlled compacted backfill (Satisfactory Soil Material) placed in the voids resulting from demolition work.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
  - 1. Division 2 Section "Site Clearing" for site stripping, grubbing, topsoil removal.
  - 2. Division 2 Section "Selective Demolition" for backfilling of voids created by demolition of site improvements.
  - 3. Division 2 Section "Erosion Control & Sediment Control"

#### 1.3 DEFINITIONS

- A. Excavation: The removal of all material encountered to subgrade elevations and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.
- C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations. All imported material shall be certified clean and shall meet the composition requirements established herein.
- D. Sub-base Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.
- E. Base Course: The layer placed between the sub-base and surface pavement in a paving system.
- F. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Owners Representative. Unauthorized excavation, as well as remedial work directed by the Owners Representative, shall be at the Contractor's expense.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

- H. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.
- I. NJDOTSS: The New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and addenda.
- J. Site Improvement: Any man-made structure, wall, foundation, pavement, material, system, component, or topographic condition that is not naturally in existence on or under the earth.

#### **1.4 SUBMITTALS**

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for the following:
  - 1. Filter fabric.
- C. Samples of the following:
  - 1. 5 lb samples, sealed in air-tight containers, of each proposed fill and backfill soil material from on-site or borrow sources.
  - 2. 12 x 12 inch (300 x 300 mm) sample of filter fabric.
- D. Test Reports: In addition to test reports required under field quality control, submit the following:
  - 1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources. All soil shall meet the New Jersey Department of Environmental Protection, Residential Clean Fill Standards and all imported material shall be certified as such. A minimum of one soil test for every 250 cubic yards of imported material shall be performed.
  - 2. One optimum moisture-maximum density curve for each soil material encountered or used in the project.
  - 3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

#### **1.5 QUALITY ASSURANCE**

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Testing and Inspection Services:
  - 1. The Owner shall employ a qualified licensed independent geotechnical engineering & testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing for the proposed building & foundation construction as required under Chapter 17 of the International Building Code, New Jersey edition.
  - 2. All earthwork related to site work, including, but not limited to underground storm and sanitary sewer construction, site lighting bases, retaining walls, sewage pump stations, and

other related site construction shall be inspected & tested on a daily basis for proper soil composition and compaction by the Contractor's geotechnical engineer and certified material testing and inspection company.

- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."
1. Before commencing earthwork, meet with representatives of the Construction Manager, Owner, Architect, Engineer, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities, as required. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.
  2. The contractor will be expected to grade the site in accordance with the Site Grading Plan for this project and meet all adjacent surfaces around the limit of demolition work flush.

## 1.6 PROJECT CONDITIONS

- A. A subsurface geotechnical investigation was performed by Underwood Engineering consulting engineers, in December 2019, on behalf of the Owner. This information is available for contractor reference only. The following summarizes key information from that report:
1. The field investigation consisted of three (3) test borings advanced to depths of approximately twenty (20) feet below the existing ground surface elevations and two (2) test borings advanced to depths of approximately sixteen (16) feet below the existing ground surface per ASTM D-1586 on December 27, 2019.
  2. The site soils encountered in test borings TB-1 through TB-5 directly below the existing ground surface elevations consisted generally of very loose, loose and medium dense fine to coarse sands with trace/ little/ some amounts of silts and trace amounts of gravel. Based on Standard Penetration Test (SPT) data recorded during the drilling operations test borings TB-1 through TB-5 are considered loose to depths of approximately five (5), eight (8) and twelve (12) feet below the existing ground surface elevations.
  3. Test borings TB-4 & TB-5 were terminated in the medium dense sands at depths of approximately sixteen (16) feet below the existing ground surface elevations. Test borings TB-1 through TB-3 were terminated in the medium dense sands at depths of approximately twenty (20) feet below the existing ground surface elevations.
  4. The ground water table was encountered at depths of approximately ten (10) and twelve (12) feet below the existing ground surface elevations in the test borings as evidenced by direct observation and saturation of the soil samples.
  5. The estimated seasonal high-water table (ESHWT), as indicated by mottling and soil textures was observed at depths of approximately eight (8) feet below the existing ground surface elevations in the test borings. It should be noted that groundwater data presented on the individual test boring logs may not be representative of daily or seasonal variations in the ground water level. The seasonal high-water table as indicated by mottling and other soil characteristics is only an average based on long-term fluctuations in groundwater. Actual groundwater tables may significantly vary from average annual seasonal highs, based on precipitation frequencies and other factors.
- B. Neither the plans, nor the specifications state or imply that cut and fill are balanced on the project site. The contractor shall be responsible for determining the amount of export and required quantities of imported soil needed in the project.



## **PART 2 - PRODUCTS**

### **2.1 SOIL MATERIALS & AGGREGATE**

- A. General: On site granular soils, as approved by the Geotechnical Engineer, are suitable for use, as load-bearing fill but will require strict moisture control due to the presence of fine grain material (i.e. silt and clay). If on site soils are used as structural fill, they must be placed under favorable weather conditions for the soils to dry within optimum moisture content ranges. This is extremely important in order to properly compact the soils as specified herein. If inclement weather is a factor, the onsite soils may be too unstable, in which case imported select fill will be needed. The Contractor shall leave sufficient time in the construction schedule to re-condition (dry out) soils as needed to achieve optimum moisture levels that will achieve the specified compaction levels or the Contractor shall include in the contract all costs associated with importing, placing and compacting imported select fill as needed to establish subgrade for building floor slabs shall be included in the contract.
- B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of: rock or gravel, larger than 2 inches (50 mm) in any dimension; debris; waste; frozen materials; vegetation; other deleterious matter.
- C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- D. Subbase and Base Material: Dense Graded Aggregate (DGA) conforming to NJDOTSS Section 901.10.
- E. Engineered or Select Fill: Soil Aggregate Designation I -15, per NJDOTSS, latest edition.
- F. Bedding Material: Sub-base or base materials with 100 percent passing a 1 inch (25 mm) sieve and not more than 8 percent passing a No. 200 (75 micrometer) sieve.
- G. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch (38 mm) sieve and not more than 5 percent passing a No. 8 (2.36 mm) sieve.
- H. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100 percent passing a 1-1/2 inch (38 mm) sieve and 0 to 5 percent passing a No. 50 (300 micrometer) sieve.
- I. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

### **2.2 ACCESSORIES**

- A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility.
- B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm)

thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep.

1. Tape Colors: Provide tape colors to utilities as follows:
  - a. Red: Electric.
  - b. Yellow: Gas, oil, steam, and dangerous materials.
  - c. Orange: Telephone and other communications.
  - d. Blue: Water systems.
  - e. Green: Sewer systems.
  
- C. Filter Fabric: Manufacturer's standard nonwoven pervious geotextile fabric of polypropylene, nylon or polyester fibers, or a combination.
  1. Provide filter fabrics that meet or exceed the listed minimum physical properties determined according to ASTM D 4759 and the referenced standard test method in parentheses:
    - a. Grab Tensile Strength (ASTM D 4632): 100 lb (45 kg).
    - b. Apparent Opening Size (ASTM D 4751): #100 U.S. Standard (150 micrometer) sieve.
    - c. Permeability (ASTM D 4491): 150 gallons per minute per sq. ft. (102 L/s per sq. m).

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- D. Tree protection is specified in the Division 2 Section "Site Clearing."
- E. Strip Topsoil from work area. Only strip top soil from areas where work will immediately be performed. Maintain existing vegetated areas as long as possible throughout construction to control erosion. Phase the stripping of topsoil and vegetation accordingly.

### **3.2 DEWATERING**

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding the building excavation, the project site, and surrounding areas. Install de-watering pumps, piping and siltation filters (at discharge piping) as needed to keep excavations and soils dry and to prevent sediment from washing onto downstream properties and roadways.

1. De-watering pits and pumps shall (MUST) be installed in any excavation where perched water is encountered, and in any excavation deeper than 6 feet. De-watering pumps and filters shall also be used to evacuate surface water from excavations, at all times when water cannot freely drain away by gravity, unimpeded.
2. Install sedimentation control fencing downstream of all de-watering measures.
3. Install a siltation filter bag at the downstream end of discharge piping from de-watering equipment.

B. Protect subgrade soils from softening and damage by rain or water accumulation.

### **3.3 EXCAVATION**

- A. Unclassified Excavation: All excavation is unclassified and includes excavation to required subgrade elevation as needed to construct the new building and related site improvements, regardless of the character of materials and obstructions encountered.
- B. Strip topsoil layer and underlying soils to establish subgrades for foundations and pavements and construct granular subbases as noted on the plans. The total depth of excavation shall include what is required to establish subgrade for footings and pavement, inclusive of any drainage courses required in the project. Refer to foundation plans for additional notes and details.
- C. When directed by the Geotechnical Engineer, or the Owners representatives, remove and dispose of unsuitable material encountered in excavations for structures, pipes, utilities, etc.
- D. The on-site soil material may be used as compacted backfill in the upper layers of utility trenches, when soil fill is noted in the trench detail. This provision does not apply to utilities that pass beneath a foundation wall. Backfill for that section shall be  $\frac{3}{4}$ " clean stone.

### **3.4 STABILITY OF EXCAVATIONS**

- A. Soils are sandy and lack cohesion. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations. Adhere to CFR 029 for OSHA safety requirements. Shore and brace excavations as needed and terrace/slope side walls in accordance with OSHA regulations.

### **3.5 GENERAL EXCAVATION**

- A. Excavate only to the minimum extent needed to construct each site improvement, including subbase materials. All excavation shall be performed under the direct observation of the geotechnical engineer. Over excavation will not be permitted and no additional payment will be made for said work.

### **3.6 APPROVAL OF SUBGRADE**

- A. Geotechnical Engineering oversight must be provided when excavation has reached subgrade, so soil conditions can be analyzed.
- B. When the Geotechnical Engineer determines that unforeseen unsatisfactory soil is present, continue excavation deeper, and take the following action:

1. Beneath building foundation systems, backfill with ¾" clean stone material as directed.
  2. Beneath pavements, walkways, walls and other site improvements, backfill with prepared and compacted, moisture-controlled on-site Soil Fill material per the Geotechnical Engineer.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Geotechnical Engineer and/or Owners' Representative at no additional cost.

### **3.7 UNAUTHORIZED EXCAVATION**

- A. All excavation and backfilling within the building footprint shall be performed under the presence of the Owner's Geotechnical Engineer. Excavation and backfilling in other areas shall be performed under the presence of the Contractor's Geotechnical Engineer. All excavation shall extend only to the limits needed to properly construct each site improvement so that it is bearing on suitable subgrade. Any excavation beyond suitable subgrade that has not been authorized by a Geotechnical Engineer and the construction manager shall be considered unauthorized.

### **3.8 STORAGE OF SOIL MATERIALS**

- A. Stockpile excavated materials acceptable for backfill in designated area, including suitable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust. Place siltation control fencing around the downslope side of all piles.
1. Stockpile soil materials away from edge of excavations.

### **3.9 FILL AND BACKFILL**

- A. Backfill excavations promptly, but not before completing the following:
1. Testing and compaction of existing subgrade.
  2. Acceptance of subgrade by the Geotechnical Engineer.
  3. Surveying locations of underground utilities, unusual geological formations, or other features to remain for record documents.
  4. Testing, inspecting, and approval of underground utilities.
  2. Removal of trash and debris from excavation.
  3. Removal of temporary shoring and bracing, and sheeting.
  4. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. The exposed subgrades for the slab on grades and any paved areas are to be proofrolled with a vibratory compactor in the presence of the soil engineer to detect and repair any unsuitable soil conditions and to attain a uniform firm subgrade throughout. Any loose soils encountered may be densified by proofrolling and further compaction by additional passes if necessary. This is extremely important due to areas of loose soils encountered in the test borings.
- C. Remove two (2) feet of the loose soils beneath the slab-on- grade subgrade foundation areas to a width of five (5) feet beyond the building lines to stable natural ground. Deeper excavations may

be required where fill/ loose soils are encountered in areas other than those identified during the initial subsurface investigation. Densify the exposed subgrade with a minimum of six (6) passes with a twenty (20) ton equivalent vibratory compactor to 95 % of the material's maximum dry density per ASTM D-698. Backfill and densify approved structural fill (over excavated loose granular soils screened free of any organic materials or imported structural fill) to 95 % the materials maximum dry density in accordance with recommendations listed under Compaction.

- D. Building subgrades may be brought up to desired elevation with approved on-site soils or imported structural (select) fill in lifts no greater than twelve ( 12) inches loose thickness and compacted to 95% of the material's maximum dry density per ASTM D-698. Materials compacted by hand operated equipment shall be placed in lifts no greater than four (4) inches loose thickness.
- E. Backfill all voids from demolition work and utility trenching with suitable on-site soil material or satisfactory soil material compacted in maximum 12 inch lifts, to minimum 95% maximum density per ASTM D-698, under the direct supervision of the Geotechnical Engineer. Bring compacted backfill material to required subgrade elevation, accounting for the thickness of subbase materials, as required.
- F. Place suitable Soil Fill in areas where the grade is being raised, in lifts not exceeding 12 inches and thoroughly compact to 95% dry density per ASTM D-698. Soil Fill shall be moisture-controlled and prepared as noted in Part 2.1.

### **3.60 MOISTURE CONTROL**

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content per ASTM D-1557.
  - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to 95% maximum density per ASTM D-1557.
    - a. Stockpile or spread and dry removed wet satisfactory soil material.
  - 3. Include in project schedule, sufficient time for moisture control measures to restore soil stability due to unforeseen prolonged periods of inclement or unseasonable weather.

### **3.71 COMPACTION**

- A. Strip topsoil and remove upper 2 feet of soil. Thoroughly densify the exposed subgrade with a minimum of six (6) passes with a twenty (20) ton equivalent vibratory compactor to 95 % of the material's maximum dry density per ASTM D-698. In confined areas, smaller compacting equipment shall be used. The compaction of soils shall be tested and accepted by the geotechnical engineer before placing fill or back fill. Building subgrades may be brought up to desired elevation with approved on-site soils or imported structural (select) fill in lifts no greater than twelve ( 12) inches loose thickness and compacted to 95% of the material's maximum dry density per ASTM D-698. Repeat compaction operations and remove any unstable soils, replacing same with on-site suitable material or borrow. All exposed footing subgrades are to be compacted by two (2) passes with a jumping jack compactor immediately prior to the placement of the footing concrete.
- B. In areas where grades are being lowered, excavate and remove soils down to the required subgrade elevation and perform subgrade soil compaction as described in Part A above.

- C. Place backfill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.
- D. Place backfill materials evenly across open excavations to required elevations. Place backfill uniformly along the full length of each area.
- E. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 698:
  - 1. Compact areas within building footprint and 5 feet thereof to 95 percent maximum dry density.
  - 2. Compact pavement and structural slab subgrade soils to 98 percent maximum dry density per ASTM D698.
  - 3. Other areas of the site, including lawn areas, compact subgrade soils to 90% maximum dry density per ASTM D698
- F. All backfill shall be inspected and compaction tested by a geotechnical engineer and certified materials testing & inspection company. All inspection and testing reports shall be furnished to the Owner's Representative on a weekly basis.

### **3.12 GRADING**

- A. General: Strip topsoil from areas to be graded, section-by-section, exposing subgrade soils only when absolutely necessary. Uniformly grade areas to a smooth surface, to maintain positive overland drainage, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Employ interim grading measures as needed to maintain the site in good condition.
  - 1. Provide a smooth transition between existing adjacent grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish grades to required elevations within the following tolerances:
  - 1. All areas: Plus or minus ½ inch (13 mm).

### **3.13 FIELD QUALITY CONTROL**

- A. Testing Agency Services: All soil inspection and compaction testing shall be under the supervision of a licensed geotechnical engineer. Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
  - 1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
    - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
    - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.
  - 2. At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2000 sq. ft. (186 sq. m) or less of area, but in no case fewer than three tests.
  - 3. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet (45 m) or less of trench, but no fewer than two tests.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, re-compact and retest until required density is obtained. Continue this process until specified compaction is achieved. The contractor may elect to excavate and replace the soil material with imported Satisfactory Soil Material and re-compact same to achieve required density, however, this work shall be treated as unauthorized excavation and no additional payment will be made.

### **3.14 PROTECTION**

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, standing water, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or loose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace material to depth directed by the Construction Manager / Owners Representative; reshape and recompact at optimum moisture content to the required density under the supervision of the Geotechnical Engineer.
- C. Settling: Where settling occurs during the maintenance period, remove finished surfacing, test compaction levels, backfill with additional approved material, compact, test compaction levels, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
- D. Provide de-watering measures at all times. The on-site soils must not be allowed to become too wet.

**3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

- A. Disposal: Remove waste material, including excess unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property. There shall be no excess material, as the site shall be graded uniformly as shown on the Grading Plan and all surfaces shall meet existing grades around the perimeter of the site flush (or to the designated grade shown on the plan).
- B. There shall be no excess soil material stockpiled on the project site at the end of this work.

**END OF SECTION 02200**



## **SECTION 02220 - EROSION CONTROL AND SEDIMENT CONTROL**

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### **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.
- B. All work under this item must comply with the Standards for Soil Erosion and Sediment Control in New Jersey, and the latest revisions thereto. Additionally, this work is subject to the review and inspection by the Soil Conservation District, and the Contractor shall comply with all directives issued by the District. Any penalties levied by the District, or any direct or consequential damages arising out of a Stop Work Order issued by the District, if due to inaction by the Contractor, or failure to comply with the Soil Erosion and Sediment Control approval issued by the District, shall be borne solely by the Contractor, at no additional cost to the Owner.

#### **1.2 SUMMARY**

- A. Soil Erosion and Sediment Control measures are shown on the plans and all measures must be in place before land disturbance begins. The contractor shall maintain these measures and supplement the measures as needed to accommodate the progression of construction. The contractor shall relocate the siltation control fence to provide clearance for the work, relocate the stabilized construction entrance, provide additional temporary topsoil and seeding to exposed soils, and install additional silt fence as needed to insure that soils remain on-site and that erosion is controlled.

### **PART 2 PRODUCTS**

#### **2.1 EROSION CONTROL DEVICES**

- A. Silt Fence may be commercially available silt fence systems, consisting of synthetic geotextile fabrics and hardwood stakes. The height of the fence shall be a minimum of three (3) feet, and the fabric shall be wide enough to allow for a minimum embedment in the ground of one (1) foot of fabric. Sections shall be joined in a manner such that the fence shall function continuously.
- B. Miscellaneous materials shall conform to NJDOTSS Sections 909.09 and 909.11.
- C. All other materials shall conform to the Plans as indicated on the details for Soil Erosion and Sediment Control, and the NJDOTSS Supplemental Specifications, Section 111.

### **PART 3 EXECUTION**

### **3.1 GENERAL**

- A. The contractor shall maintain and supplement all permanent soil erosion and sediment control measures during the entire duration of the project. Temporary features shall be incorporated with the permanent features and with the earthwork, pavement and building construction, drainage, etc., to maintain the maximum protection against soil erosion and sedimentation possible, throughout the life of the contract.
- B. All erosion and sediment control practices shall conform to the Plans, the Standards for Soil Erosion and Sediment Control in the State of New Jersey, and the approval from the Soil Conservation District.
- C. A schedule of construction operations shall be submitted to the Owners representatives for approval. Said schedule shall outline construction phasing and shall indicate how and where erosion control measures will be utilized to conform with the approval. The schedule shall include indications of locations for construction staging, soil stockpiles, etc., and any disturbances outside the limit of work shown on the Plans.
- D. All water pumped from excavations shall be filtered before being discharged off site, to prevent downstream siltation.
- E. The smallest practicable area of land shall be disturbed at any one time during the project and, whenever feasible, natural vegetation shall be retained and protected. Stripping of vegetation, grading and other solid disturbances shall be completed in a manner that will minimize soil erosion and sedimentation.
- F. Soil erosion and sediment control notes are shown on the Soil Erosions Sediment Control Plan and shall be followed.
- G. All other construction procedures shall conform to the NJDOTSS Supplemental Specifications.

**END OF SECTION 02220**

## **SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTION**

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### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Excavating and backfilling trenches for buried storm sewer, sanitary sewer, natural gas, and mechanical and electrical utilities.

#### **1.3 DEFINITIONS**

- A. Backfill: Soil materials used to fill an excavation.
- B. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- C. Excavation: Removal of material encountered above subgrade elevations.
- D. Fill: Soil materials used to raise existing grades.
- E. Utilities include underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### **1.4 SUBMITTALS**

- A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
  - 1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
  - 2. Certification that all imported materials are "clean" per NJ DEP Residential Clean Fill Standards.

#### **1.5 QUALITY ASSURANCE**

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials testing, as documented according to ASTM D 3740 and ASTM E 548, shall certify the compaction of all utility trenches. Refer to section 02050.

## **1.6 PROJECT CONDITIONS**

- A. Existing Utilities: Perform underground utility mark out as explained in the Site Demolition Section. Do not interrupt existing public utilities.

## **PART 2 - PRODUCTS**

### **2.1 SOIL MATERIALS**

- A. General: Provide borrow soil materials when sufficient satisfactory Soil Fill materials are not available from excavations.
- B. On-site soils are suitable for re-use as compacted backfill in trenches (as allowed by construction details) provided that they are prepared and moisture-controlled in accordance with the earthwork specifications.

## **PART 3 - EXECUTION**

### **3.1 EXCAVATION FOR UTILITY TRENCHES**

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 24 inches higher than top of pipe or conduit, unless otherwise indicated. Provide trench shoring or slope the sidewalls of trenches in accordance with OSHA requirements, Code of Federal Regulations 029.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade. No trench bottom shall be over excavated. If over excavation occurs, the over excavated area shall be filled and compacted as directed by the Engineer or filled with crushed stone to the correct elevation.
- D. Compact trench bottoms and test prior to placing backfill materials.

### **3.2 STORAGE OF SOIL MATERIALS**

- A. Stockpile borrow materials and satisfactory excavated soil materials as directed by the Engineer. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water.

### **3.3 BACKFILL**

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for record documents.
  - 3. Inspecting and testing underground utilities.

### **3.4 UTILITY TRENCH BACKFILL**

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings.
- C. Place and compact initial backfill of subbase material, free of particles larger than 1 inch to a height of 12 inches over the utility pipe or conduit.
  - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit.
- D. Coordinate backfilling with utilities testing.
- E. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- F. Place and compact final backfill of satisfactory soil material to final subgrade.
- G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### **3.5 COMPACTION OF BACKFILLS AND FILLS**

- A. Place backfill and fill materials in layers not more than 10 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil to not less than 95% percentages of maximum dry unit weight according to ASTM D 698:

**END OF SECTION 02221**

## **SECTION 02240 - DEWATERING**

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### **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 construction dewatering for perched or seasonal high ground water conditions.
- B. Related Sections include the following:
  - 1. Division 2 Section "Earthwork" for excavating, backfilling, and site grading.

#### **1.3 PERFORMANCE REQUIREMENTS**

- A. Dewatering Performance: Design, provide, test, operate, monitor, and maintain a dewatering system of sufficient scope, size, and capacity to control surface and ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.
  - 1. Work includes removing dewatering system when no longer needed.
  - 2. Maintain dewatering operations to ensure erosion is controlled, stability of excavations and constructed slopes is maintained, and flooding of excavation and damage to structures are prevented.
  - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 4. Accomplish dewatering without damaging existing buildings adjacent to excavation.
  - 5. Install filtration measures at the downstream end of discharge piping to insure that silt laden water does not leave the site.

#### **1.4 SUBMITTALS**

- A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.
  - 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
  - 2. Include a written report outlining control procedures to be adopted if dewatering problems arise.

3. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Qualification Data: For firms and persons specified in "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.
- C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.
- D. Record drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.
- E. Field Test Reports: Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.

#### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform dewatering who has specialized in installing dewatering systems similar to those required for this Project and with a record of successful in-service performance.
- B. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

#### **1.6 PROJECT CONDITIONS**

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Architect and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Survey adjacent structures and improvements, employing a qualified professional engineer or surveyor, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
  1. During dewatering, resurvey benchmarks weekly, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

#### **PART 2 - PRODUCTS (Not Applicable)**

## **PART – 3 EXECUTION**

### **3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
  - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
  - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

### **3.2 DEWATERING**

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
- B. Before excavation below ground-water level, place system into operation to lower water to specified levels and then operate it continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Dispose of water removed from excavations in a manner to avoid endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner to avoid inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction. Install sediment filtration measures at the discharge end of piping.



- E. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on a continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense.
- F. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

**END OF SECTION 02240**

## **SECTION 02260 – EXCAVATION SUPPORT SYSTEMS**

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### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract and Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes, but is not limited to, the following:
  - 1. Shoring and bracing necessary to protect existing buildings, streets, walkways, utilities, and other improvements and excavation against loss of ground or caving embankments.
  - 2. Maintenance of shoring and bracing.
  - 3. Removal of shoring and bracing, as required.
- B. Building structure installation will be specified by others.

#### **1.3 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Layout drawings for excavation support system and other data prepared by, or under the supervision of, a qualified professional engineer. System design and calculations must be acceptable to local authorities having jurisdiction, as well as OSHA.
- C. Trench details shown on the site plans are intended to provide information regarding backfilling materials, general material depths and payment limits only. The Contractor shall be responsible for the means and methods of construction and shall provide appropriate safety measures, sheeting, and bracing as may be required due to field conditions. The Contractor shall comply with all applicable OSHA standards and details for trench excavation. The design engineer assumes no responsibility or liability for field conditions, trenching or backfilling operations during construction.

#### **1.4 QUALITY ASSURANCE**

- A. Engineer Qualifications: A professional engineer legally authorized to practice in jurisdiction where Project is located, and experienced in providing successful engineering services for excavation support systems similar in extent required for this Project.
- B. Supervision: Engage and assign supervision of excavation support system to a qualified professional engineer.

1. Submit name of engaged consultant and qualifying technical experience.
- C. Regulations: Comply with codes and ordinances of governing authorities having jurisdiction.

#### **1.5 JOB CONDITIONS**

- A. Before starting work, verify governing dimensions and elevations. Verify condition of adjoining properties. Take photographs to record any existing conditions not readily identified on the plans. Prepare a list of such damages, verified by dated photographs, and signed by Contractor and others conducting investigation.
- B. During excavation, resurvey benchmarks weekly, maintaining accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks, sags or other damage is evident.

#### **1.6 EXISTING UTILITIES**

- A. Protect existing active sewer, water, gas, electricity and other utility services and structures, if any.
- B. Notify municipal agencies and service utility companies having jurisdiction. Comply with requirements of governing authorities and agencies for protection, relocation, removal, and discontinuing of services.

**END OF SECTION 02260**

## **SECTION 02360 - STORM DRAINAGE**

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### **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 storm drainage outside the building.

#### **1.3 PERFORMANCE REQUIREMENTS**

- A. Gravity-Flow, Non-pressure Piping Pressure Ratings: At least equal to system test pressure.

#### **1.4 SUBMITTALS**

- A. Shop Drawings: Include plans, elevations, details, and attachments for the following:
  - 1. Precast concrete manholes and other structures, including frames, covers, and grates.
- B. Coordination Drawings: Show manholes and other structures, pipe sizes, locations, and elevations. Include details of underground structures and connections. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.
- C. Design Mix Reports and Calculations: For each class of cast-in-place concrete.
- D. Field Test Reports: Provide daily inspection reports that document field construction and interpret test results for compliance with performance requirements.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Do not store plastic structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

#### **1.6 PROJECT CONDITIONS**

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Architect or Engineer not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Architect or Engineer's written permission.

## **1.7 QUALITY ASSURANCE**

- A. Testing and inspection service for quality control testing during storm drainage system construction will be coordinated by the contractor in accordance with Specification Section 02050.

## **PART 2 - PRODUCTS**

### **2.1 PIPING MATERIALS**

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe and fitting materials.

### **2.2 PIPES AND FITTINGS**

- A. Polyvinyl Chloride (PVC) Sewer Pipe and Fittings: ASTM D 3034, SCH40 and SDR 35, for solvent-cemented or gasketed joints. Acceptable products are manufactured by CertainTeed Corp, Charlotte Pipe, JM Eagle, or approved equal.
  - 1. Primer: ASTM F 656.
  - 2. Solvent Cement: ASTM D 2564.
  - 3. Gaskets: ASTM F, elastomeric seal.
- B. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76 (ASTM C 76M), Class III, Wall B, for gasketed joints. Use Class V for areas where pipe cover is limited as shown on the plans. Acceptable products are manufactured by Vianini Pipe Co., Oldcastle Precast, Modern Concrete, or approved equal.
  - 1. Gaskets: ASTM C 443 (ASTM C 443M), rubber.
- C. Polyethylene Pipe (PEP): ASTM D3350, AASHTO M294. Acceptable manufacturers include Hancor "Hi-Q", ADS "N-12", smooth interior lined pipe, or approved equal. Provide and install all required couplers, fittings, gaskets, etc.. as needed.
  - 1. Fittings: Pipe joints and fittings shall conform to AASHTO M252, ASTM D1056, AASHTO M294.

## **2.3 SPECIAL PIPE COUPLINGS AND FITTINGS**

- A. Bushing-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric bushing fabricated to mate with OD of smaller pipe and ID of adjoining larger pipe, for nonpressure joints.
  - 1. Material for Concrete Pipe: ASTM C 443 (ASTM C 443M), rubber.

## **2.4 MANHOLES**

- A. Normal-Traffic Precast Concrete Manholes: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
  - 1. Diameter: 48 inches (1200 mm) minimum, unless otherwise indicated.
  - 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
  - 3. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (100-mm) minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  - 4. Riser Sections: 4-inch (100-mm) minimum thickness, and lengths to provide depth indicated.
  - 5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  - 6. Gaskets: ASTM C 443 (ASTM C 443M), rubber.
  - 7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch (150- to 229-mm) total thickness, that match 24-inch- (610-mm-) diameter frame and cover. Adjust to grade with courses of brick (12" max.)
  - 8. Steps: ASTM C 478 (ASTM C 478M), individual steps or ladder. Omit steps for manholes less than 60 inches (1500 mm) deep.
  - 9. Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.
- B. Manhole Frames and Covers: ASTM A 48-83, Class 30B, gray-iron castings designed for heavy-duty service. Include 23-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 25-3/8-inch-diameter cover. Include indented top design with lettering "STORM SEWER" cast into cover. Acceptable products are manufactured by Campbell Foundry, Neenah Foundry, or approved equal.
- C. Acceptable manufacturers of pre-cast units include Modern Concrete, Oldcastle Precast, Flemington Precast & Supply, or approved equal.

## **2.5 CATCH BASINS**

- A. Normal-Traffic, Precast Concrete Catch Basins (NJ DOT standard inlet designations as noted on the plans): ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.

1. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (100-mm) minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  2. Riser Sections: 4-inch (100-mm) minimum thickness, 48-inch (1220-mm) diameter, and lengths to provide depth indicated.
  3. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  4. Gaskets: ASTM C 443 (ASTM C 443M), rubber.
  5. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch (150- to 229-mm) total thickness, that match 24-inch- (610-mm-) diameter frame and grate.
  6. Steps: ASTM C 478 (ASTM C 478M), individual steps or ladder. Omit steps for catch basins less than 60 inches (1500 mm) deep.
  7. Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.
  8. Bottom, Walls, and Top: Reinforced concrete.
  9. Channels and Benches: Concrete.
  10. Steps: ASTM C 478 (ASTM C 478M), individual steps or ladder. Omit steps for catch basins less than 60 inches deep.
- B. Frames and Grates: ASTM A 48-83, Class 30B, gray iron designed for heavy-duty service. Include flat grate with small square or short-slotted drainage openings. Acceptable products are manufactured by Campbell Foundry, Neenah Foundry, or approved equal.
1. Size: As indicated on plan set.
  2. Grate Free Area: Approximately 50 percent, unless otherwise indicated.
- C. Acceptable manufacturers of pre-cast units include Modern Concrete, Oldcastle Precast, Flemington Precast & Supply, or approved equal.

## 2.6 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.
- B. Portland Cement Design Mix: 4500 psi (27.6 MPa) minimum, with 0.45 maximum water-cementitious ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed steel.
- C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4500 psi (27.6 MPa) minimum, with 0.45 maximum water-cementitious ratio.
1. Include channels and benches in manholes.
    - a. Channels: Concrete invert, formed to same width as connected piping, with height

of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

- 1) Invert Slope: 1 percent through manhole.
    - b. Benches: Concrete, sloped to drain into channel.
  - 2) Slope: 4 percent.
2. Include channels in catch basins.
    - a. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
      - 1) Invert Slope: 1 percent through catch basin.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi (20.7 MPa) minimum, with 0.58 maximum water-cementitious ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed steel.

## **2.7 PROTECTIVE COATINGS**

- A. Description: One- or two-coat, coal-tar epoxy; 15-mil (0.38-mm) minimum thickness, unless otherwise indicated; factory or field applied to the following surfaces:
1. Concrete Manholes: On exterior surface.
  2. Manhole Frames and Covers: On entire surfaces.
  3. Catch Basins: On exterior surface.
  4. Catch Basin Frames and Grates: On entire surfaces.
  5. Stormwater Inlets: On exterior surface.
  6. Stormwater Inlet Frames and Grates: On entire surfaces.
  7. Stormwater Detention Structures: On exterior surface.
  8. Stormwater Detention-Structure Manhole Frames and Covers: On entire surfaces.

## **PART 3 - EXECUTION**

### **3.1 EARTHWORK**

- A. Excavating, trenching, and backfilling are specified in Division 2 Section 02200 and 02221.

### **3.2 IDENTIFICATION**

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
8. Use warning tape or detectable warning tape over ferrous piping.
  9. Use detectable warning tape over nonferrous piping and over edges of underground structures.



### **3.3 PIPING APPLICATIONS**

- A. General: Include watertight, silttight, or soiltight joints, unless watertight or silttight joints are indicated.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.
- C. Gravity-Flow Piping: Use the following:
  - 1. NPS 8 to NPS 15 (DN200 to DN375): NPS 12 and NPS 15 (DN300 and DN375) reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints. Do not use nonreinforced pipe instead of reinforced concrete pipe in NPS 8 and NPS 10 (DN200 and DN250).
  - 2. NPS 18 to NPS 36 (DN450 to DN900): Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
  - 3. PVC Sewer Pipe and Fittings, NPS 15 (DN375) and smaller, SCH40, for solvent-cemented or gasketed joints.
  - 4. Polyethylene Pipe (PEP): ASTM D3350, AASHTO M294, Hancor "Hi-Q" or ADS "N-12", smooth interior liner or approved equal. Provide and install all required couplers, fittings, gaskets, etc... as needed.
    - a. Fittings: Pipe joints and fittings shall conform to AASHTO M252, ASTM D1056, AASHTO M294.

### **3.4 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS**

- A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
  - 1. Use the following pipe couplings for non-pressure applications:
    - a. Sleeve type to join piping, of same size, or with small difference in OD.
    - b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
    - c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
  - 2. Use pressure-type pipe couplings for force-main joints. Include PE film, pipe encasement.
- B. Special Pipe Fittings: Use where indicated. Include PE film, pipe encasement.

### **3.5 INSTALLATION, GENERAL**

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and

other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.

- C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Install gravity-flow piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.
  - 1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.
- F. Extend storm drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

### **3.6 PIPE JOINT CONSTRUCTION AND INSTALLATION**

- A. General: Join and install pipe and fittings according to installations indicated.

### **3.7 MANHOLE INSTALLATION**

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.
- C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere, unless otherwise indicated.
- D. Install precast concrete manhole sections with gaskets according to ASTM C 891.
- E. Construct cast-in-place manholes as indicated.

### **3.8 CATCH-BASIN INSTALLATION**

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated. Use courses of brick to adjust grades to proposed grade as needed.

### **3.9 CONCRETE PLACEMENT**

- A. Cast in place concrete to be 4,000 psi.

### 3.9 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
  - 1. In large, accessible piping, brushes and brooms may be used for cleaning.
  - 2. Place plug in end of incomplete piping at end of day and when work stops.
  - 3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.
  
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of Project.
  - 1. Submit separate reports for each system inspection.
  - 2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  - 4. Reinspect and repeat procedure until results are satisfactory.
  
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
  - 1. Do not enclose, cover, or put into service before inspection and approval.
  - 2. Test completed piping systems according to authorities having jurisdiction.
  - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  - 4. Submit separate reports for each test.
  - 5. Leaks and loss in test pressure constitute defects that must be repaired.
  - 6. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.
  
- D. Furnish inspection and test reports from the Contractor's certified materials testing and inspection company for all work performed, certifying that all construction and materials meets or exceeds the specifications.

**END OF SECTION 02360**

## SECTION 02400 - HOT-MIX ASPHALT PAVING

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### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Hot-mix asphalt (HMA) paving (top and base courses) conforming to the New Jersey Department of Transportation Standard Specifications (NJDOTSS) for the construction of new "Superpave" bituminous (HMA) concrete pavements as shown on the drawings.
  - 2. Restoration of pavements due to installation or replacement of storm or sanitary sewers, utilities, or other underground structures, or due to excavation for other work adjacent to pavements.
- B. Related Sections include the following:
  - 1. Division 2 Section "Earthwork" for aggregate subbase and base courses.

#### 1.2 SYSTEM DESCRIPTION

- A. Provide super pave hot-mix asphalt (HMA) pavement according to the materials, workmanship, and other applicable requirements of the standard specifications of the state or of authorities having jurisdiction.
  - 1. Standard Specification: NJDOT Standard Specifications for Road and Bridge Construction (NJDOTSS), latest edition, with amendments.

#### 1.3 SUBMITTALS

- A. Product Data: For each product specified. Include technical data and tested physical and performance properties.
- B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- C. Samples: 12 by 12 inches (300 by 300 mm) minimum, of paving fabric.
- D. 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 Engineers and owners, and other information specified.

- E. Material Test Reports: Indicate and interpret test results for compliance of materials with requirements indicated.
- F. Material Certificates: Certificates signed by manufacturers certifying that each material complies with requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
  - 1. Firm shall be a registered and approved paving mix manufacturer with authorities having jurisdiction or with the NJDOT.
- C. Schedule and Coordinate all material testing and inspection work in accordance with Section 02050. Any pavement that has not been tested and inspected will not be accepted. All testing and inspection work shall adhere to NJ DOT Standard Specifications for Road and Bridge Construction, whichever is more stringent.
- D. Regulatory Requirements: Conform to applicable standards of authorities having jurisdiction for asphalt paving work on public property.
- E. Asphalt-Paving Publication: Comply with the Asphalt Institute's "The Asphalt Handbook," except where more stringent requirements are indicated.
- F. Pre-installation Conference: Conduct conference at Project site with Geotechnical Engineer and Testing Company to comply with requirements of Division 1 Section "Project Meetings" Review methods and procedures related to asphalt paving including, but not limited to, the following:
  - 1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
  - 2. Review condition of substrate and preparatory work performed on the subgrade.
  - 3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
  - 4. Review and finalize construction schedule for paving and related work. Verify availability of materials, paving Installer's personnel, and equipment required to execute the Work without delays.
  - 5. Review inspection and testing requirements, governing regulations, and proposed installation procedures.
  - 6. Review forecasted weather conditions and procedures for coping with unfavorable conditions.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Conform to applicable NJDOTSS requirements.

## **1.6 PROJECT CONDITIONS**

- A. Pavements, weather limitations and laydown conditions: Conform to NJDOTSS Sections 404.12 and 404.13, including requirements for prime and tack coats, which also shall be included in the overall contract.

## **PART 2 - PRODUCTS**

### **2.1 PAVEMENTS AND BASE COURSES**

- A. General: Use materials, gradations, and product formulations conforming to the NJDOTSS.
- B. Bituminous Stabilized Base Course: NJDOTSS Division 400. Mix shall be HMA 19M64.
- C. Bituminous Concrete Surface Course (i.e. pavement top course or layers): NJDOTSS Division 400. Mix shall be HMA 9.5M64.
- D. Prime Coat: NJDOTSS Section 401.03.02
- E. Tack Coat: NJDOTSS Section 401.03.02
- F. Water: Potable.

### **2.2 AUXILIARY MATERIALS**

- A. Herbicide: Commercial chemical for weed control, registered by Environmental Protection Agency (EPA). Provide granular, liquid, or wettable powder form.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
- B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.
- C. Notify Owner, in writing, of any unsatisfactory conditions. Do not begin paving installation until these conditions have been satisfactorily corrected.

### **3.2 PATCHING AND REPAIRS**

- A. Patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Recompact new subgrade. Excavate rectangular or trapezoidal patches, extending 12 inches (300

mm) into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.

1. Tack coat faces of excavation and allow to cure before paving.
2. Partially fill excavation with dense-graded, hot-mix asphalt base mix and compact while still hot. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.
3. Thickness shall conform to existing pavement thicknesses, however, in no case shall the total thickness of bituminous pavement for patching or restoration be less than five (5) inches.

- B. Temporary patching is not allowed in public roadways. Permanent pavement must be constructed in public roadways immediately upon completion of the related work. In other areas, temporary pavement patching is permitted, until such time and permanent pavement is installed. Temporary patching shall be continuously maintained to a safe and uniform condition. Temporary patching shall be constructed flush with adjacent surfaces, with no lips or irregularities in the paving surface. Temporary patching may consist of either Superpave HMA 9.5M64 or Marshall Mix FABC-1 surface course.

### **3.3 SURFACE PREPARATION**

- A. General: Conform to NJDOTSS Divisions 300 and 400 as applicable, including all referenced sections.

### **3.4 HOT-MIX ASPHALT INSTALLATION**

- A. Transportation and delivery, spreading and finishing, and compaction of the material shall conform to NJDOTSS Division 400 and related sections.

### **3.5 THICKNESS REQUIREMENTS AND FINISH SURFACE REQUIREMENTS**

- A. Thickness: Conform to NJDOTSS Division 400.
- B. Surface Smoothness: Conform to NJDOTSS Division 400.

### **3.6 FIELD QUALITY CONTROL**

- A. Testing Agency: Refer to Section 02050.
1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
  2. Contractor must schedule its work and coordinate with the Testing Agency.
- B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.
- C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to NJDOTSS.

- D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to NJDOTSS and tested for compliance.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

**END OF SECTION 02400**



## **SECTION 02510 – WATER DISTRIBUTION**

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### **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 piping and specialties for combined potable-water and fire-protection water service outside the building, including connection to existing system.

#### **1.3 DEFINITIONS**

- A. The following are industry abbreviations for water piping materials:
  - 1. PVC: Polyvinyl chloride.
  - 2. C: Copper, Type “K” rated for direct burial.
  - 3. HDPE: High Density Polyethylene Pipe

#### **1.4 SYSTEM PERFORMANCE REQUIREMENTS**

- A. Minimum Working Pressures: Shall be as determined by the local water company or utility. The local water utility company has modeled the water system and reports that the following data should apply:

Simulated Flow Test Location – 12” main on S Reeds Rd, Galloway Township, NJ.

Fire Hydrant: HGT-149

Elevation at Flow Test – 43.0 feet MSL

Existing Piping = 12” main on S Reeds Rd. Flow test run on HGT-149, at 117 S Reeds Rd.

Static Pressure (7:00 am) = 57.0 psi

Flow = 1,500 gpm

Residual Pressure (7:00 am) = 41.0 psi

#### **1.5 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Pipe and fittings.
  - 2. Flexible pipe fittings.
  - 3. Valves.

- B. Record Drawings: At Project closeout of installed water-service piping according to Division 1 Section "Contract Closeout."
- C. Test Reports: As specified in "Field Quality Control" Article in Part 3.
- D. Purging and Disinfecting Reports: As specified in "Cleaning" Article in Part 3.
- E. Maintenance Data: For specialties to include in the maintenance manuals specified in Division 1. Include data for the following:
  - 1. Valves.

## **1.6 QUALITY ASSURANCE**

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of water-service piping specialties and are based on specific types and models indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions." All products shall comply with latest AWWA Specifications.
- B. Comply with requirements of utility supplying water. Include coordination of water service installation.
- C. Comply with standards of authorities having jurisdiction for potable water-service piping. Include materials, installation, testing, and disinfection as well as the installation of additional ports, valves and fittings needed for pressure testing and disinfection.
- D. Comply with NSF 61, "Drinking Water System Components--Health Effects," for materials for potable water.
- E. Provide listing/approval stamp, label, or other marking on piping and specialties made to specified standards.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Preparation for Transport: Prepare valves and fittings, according to the following:
  - 2. Ensure that valves are dry and internally protected against rust and corrosion.
  - 3. Protect valves against damage to threaded ends and flange faces.
  - 4. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
  - 1. Do not remove end protectors, unless necessary for inspection; then reinstall for storage.
  - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels or stems as lifting or rigging points.

- D. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

## **1.8 PROJECT CONDITIONS**

- A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located. Engage a private underground utility mark out service to mark out utility locations in areas where the NJ One Call service will not mark out.
- B. Site Information: Reports on subsurface condition investigations made during design of Project are available for informational purposes only; data in reports are not intended as representations or warranties of accuracy or continuity of conditions between soil borings. Owner assumes no responsibility for interpretations or conclusions drawn from this information.
- C. Service Coordination: Coordinate the new water service installation with the local water utility, namely NJ American Water Company, Ms. Robin Perri, Telephone (609) 241-4100. This service application process has already been initiated.

## **1.9 SEQUENCING AND SCHEDULING**

- A. Coordinate connection to water main with utility company.
- B. Coordinate piping materials, sizes, entry locations, and pressure requirements with building water distribution piping. Provide all required adapters, couplers and reducers to transition from exterior water distribution piping to the interior plumbing and fire suppression system piping.
- C. Coordinate with other utility work.

## **PART 2 PRODUCTS**

### **2.1 PIPE MATERIALS**

1. Acceptable pipe materials for water supply piping shall be as specified in the National Plumbing Code – NJ Edition and as permitted by the local plumbing subcode official. The Basis of Design material is Copper, ASTM B 88 seamless water tube, annealed temper, Type “K” rated for direct burial, or approved equal.

## 2.2 MANUFACTURERS

A. Manufacturers: Provide products by one of the following or approved equal:

1. Drilling-Machine, Sleeves, and Corporation Stops:
  - a. Ford Meter Box Co., Inc.
  - b. Grinnell Corp.; Mueller Co.; Water Products Div.
  - c. Lee Brass Co.
  - d. or approved equal
2. Bronze Corporation Stops and Valves:
  - a. Ford Meter Box Co., Inc.
  - b. Grinnell Corp.; Mueller Co.; Water Products Div.
  - c. Lee Brass Co.
  - d. Master Meter, Inc.
  - e. McDonald: A.Y. McDonald Mfg. Co.
  - f. Red Hed Manufacturing Co.
  - g. Or approved equal
3. Gate Valves:
  - h. American AVK Co.
  - i. American Cast Iron Pipe Co.; American Flow Control Div.
  - j. American Cast Iron Pipe Co.; Waterous Co.
  - k. East Jordan Iron Works, Inc.
  - l. Grinnell Corp.; Grinnell Supply Sales Co.
  - m. Grinnell Corp.; Mueller Co.; Water Products Div.
  - n. Hammond Valve Corp.
  - o. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa)
  - p. McWane, Inc.; Kennedy Valve Div.
  - q. McWane, Inc.; Tyler Pipe; Utilities Div.
  - r. Milwaukee Valve Co., Inc.
  - s. Nibco, Inc.
  - t. Pratt: Henry Pratt Co.
  - u. Stockham Valves & Fittings, Inc.
  - v. United States Pipe & Foundry Co.
  - w. or approved equal.
5. Relief Valves:
  - a. Bermad, Inc.
  - b. GA Industries, Inc.
  - c. MULTIPLEX Manufacturing Co.
  - d. Oceco, Inc.
  - e. Val-Matic Valve and Manufacturing Corp. or approved equal.

## 2.3 PIPES AND TUBES

- A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
- B. Copper Tube: ASTM B 88 seamless water tube, annealed temper, Type K for direct burial water supply piping, 3" diameter and smaller.

- C. PVC Plastic Pipe: ASTM D 1785, with marking "NSF-pw" according to NSF 14.

## **2.4 PIPE AND TUBE FITTINGS**

- A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.
- B. Copper Fittings: ASME B16.22; wrought-copper, solder-joint pressure type.
- C. Cast-Copper-Alloy Flanges: ASME B16.24, Class 150 or 300, as required for system operating pressure.
- D. Polyethylene: Heat welded or barbed, clamped fittings as approved by the National Plumbing Code - NJ edition, for the indicated working pressures.

## **2.5 JOINING MATERIALS**

- A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.
- B. Brazing Filler Metals: AWS A5.8, BCuP Series.
- C. Solder Filler Metal: ASTM B 32, Alloy Sn95, Alloy Sn94, or Alloy E, with 0.10 percent maximum lead content.
- D. Pipe Couplings: Iron-body sleeve assembly, fabricated to match OD of pipes to be joined.
  - 1. Sleeve: ASTM A 126, Class B, gray iron.
  - 2. Followers: ASTM A 47, malleable iron; or ASTM A 536, ductile iron.
  - 3. Gaskets: Rubber.
  - 4. Bolts and Nuts: AWWA C111.
  - 6. Finish: Enamel paint.

## **2.6 VALVES**

- A. Rising-Stem Gate Valves, 2-Inch NPS and Smaller: UL 262, FM approved, bronze body and bonnet, OS&Y, bronze stem, 175-psig working pressure, with threaded ends.
- B. Nonrising-Stem Gate Valves, 2-Inch NPS and Smaller: MSS SP-80; body and screw bonnet of ASTM B 62 cast bronze; with Class 125 threaded ends, solid wedge, nonrising copper-silicon-alloy stem, brass packing gland, PTFE-impregnated packing, and malleable-iron handwheel.
- C. Valve Boxes: Cast-iron box with top section and cover with lettering "WATER," bottom section with base of size to fit over valve and barrel approximately 5 inches (125 mm) in diameter, and adjustable cast-iron extension of length required for depth of bury of valve.
  - 1. Provide steel tee-handle operating wrench with each valve box. Include tee handle with one pointed end, stem of length to operate valve, and socket-fitting valve-operating nut.

## **2.7 ANCHORAGES**

- A. Clamps, Straps, and Washers: ASTM A 506, steel.
- B. Concrete Reaction Backing: Portland cement concrete mix, 3000 psig .
  - 1. Cement: ASTM C 150, Type I.
  - 2. Fine Aggregate: ASTM C 33, sand.
  - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
  - 7. Water: Potable.

## **2.8 CONCRETE THRUST BLOCKS**

- A. Provide plain concrete thrust block at all changes in direction, in accordance with plan details and AWWA standards.
- B. Concrete shall be NJDOTSS, minimum 3,000 psi.

## **2.9 IDENTIFICATION**

- A. Refer to Division 2 Section "Earthwork" for underground warning tape materials.
- B. Arrange for warning tapes made of solid blue film with continuously printed black-letter caption "CAUTION--WATER LINE BURIED BELOW."
- C. Arrange for detectable warning tapes made of solid blue film with metallic core and continuously printed black-letter caption "CAUTION--WATER LINE BURIED BELOW."
- D. Nonmetallic Piping Label: Engraved, plastic-laminate label at least 1 by 3 inches, with caption "CAUTION--THIS STRUCTURE HAS NONMETALLIC WATER-SERVICE PIPING," for installation on main electrical meter panel.

## **PART 3 EXECUTION**

### **3.1 EARTHWORK**

- A. Refer to Division 2 Section "Earthwork" for excavation, trenching, and backfilling.
- B. Refer to Division 2 Section "Hot-Mix Asphalt Paving" for cutting and patching of existing paving.
- C. Refer to Division 2 Section "Portland Cement Concrete Paving" for cutting and patching of paving.

### **3.2 PIPING APPLICATIONS**

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications:
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- C. Do not use flanges or keyed couplings for underground piping.
  - 1. Exception: Piping in boxes and structures, but not buried, may be joined with flanges or keyed couplings instead of joints indicated.
- D. Flanges, keyed couplings, and special fittings may be used on aboveground piping.
- E. Potable Water-Service Piping: Use the following:
  - 1. 3/4- to 2-Inch NPS: Copper tube, Type K; copper fittings; and soldered joints.
  - 2. 3/4- to 2-Inch NPS: PE plastic pipe; fittings for PE plastic pipe; and clamped joints.
  - 3. 3/4- to 2-Inch NPS: PE plastic pipe; molded PE plastic fittings; and heat-fusion joints.

### **3.3 VALVE APPLICATIONS**

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, 2-Inch NPS and Smaller: AWWA, gate valves, with telescopic valve box.

### **3.4 JOINT CONSTRUCTION**

- A. Copper Tubing, Brazed Joints: According to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
- B. Copper Tubing, Soldered Joints: According to AWS's "Soldering Manual," Chapter "The Soldering of Pipe and Tube."
- C. Copper Tubing, Soldered Joints: According to CDA's "Copper Tube Handbook."
- D. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, OD, and system working pressure. Refer to "Piping Systems - Common Requirements" Article below for joining piping of dissimilar metals.

### **3.5 PIPING SYSTEMS - COMMON REQUIREMENTS**

- A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to minimize conflicts with other underground utilities and similar equipment installations. Coordinate water service location with the local water company and adjust the service alignment accordingly.
- B. Install piping at indicated slope and/or depth.

- C. Install components with pressure rating equal to or greater than system operating pressure.
- D. Install piping free of sags and bends.
- E. Install fittings for changes in direction and branch connections.
- F. Piping Connections: Unless otherwise indicated, make piping connections as specified below:
  - 1. Install flanges, in piping 2-1/2-inch NPS and larger, adjacent to flanged valves and at final connection to each piece of equipment with flanged pipe connection.
  - 2. Install dielectric fittings to connect piping of dissimilar metals.

### **3.6 SERVICE ENTRANCE PIPING**

- A. Extend water-service piping and connect to water-supply source and building water piping systems in locations and pipe sizes indicated. Coordinate installation with work shown on building plumbing system drawings.
  - 1. Temporarily terminate water-service piping at building wall until building water piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water piping systems when those systems are installed.
- B. Sleeves and mechanical sleeve seals are specified in Division 15 Section "Basic Mechanical Materials and Methods." All piping that passes through or under the building foundation system shall be sleeved in a steel casing pipe, sized to allow the carrier pipe to pass freely through without transferring any stresses to the carrier (interior) pipe. There shall be a minimum 1/2 inch gap between all sides of the casing and carrier pipes. The annular space between the casing pipe and carrier pipe shall be sealed watertight. Non-metallic water system piping shall be sleeved 5 feet beyond the foundation wall as required by the National Plumbing code.
- C. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- D. Anchor service-entry piping to building wall.

### **3.7 PIPING INSTALLATION**

- A. Water-Main Connection: The local water company will perform the wet tap and install a water service stub, curb stop, and meter pit near the public roadway. Coordinate with the local water company on the installation. The work in this contract will require a connection of the new water service to the outlet side of the meter and will continue the installation of the water supply piping to the new building. Include all required couplers and
- B. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- C. Bury piping with depth of cover over top at least 48 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:



### **3.8 ANCHORAGE INSTALLATION**

- A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
  - 1. Gasketed-Joint, Ductile-Iron, Potable-Water Piping: According to AWWA C600.
  - 2. Gasketed-Joint, PVC Potable-Water Piping: According to AWWA M23.
  - 3. Fire-Service Piping: According to NFPA 24.
- B. Apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of installed ferrous anchorage devices.

### **3.9 VALVE INSTALLATION**

- A. General Application: Use mechanical-joint-end valves for 3-inch NPS and larger underground installation.
- B. AWWA-Type Gate Valves: Comply with AWWA C600. Install underground valves with stem pointing up and with cast-iron valve box.
- C. Bronze Corporation Stops and Curb Stops: Comply with manufacturer's written instructions. Install underground curb stops with head pointed up and with cast-iron curb box.

### **3.10 FIELD QUALITY CONTROL**

- A. Piping Tests: Install additional ports, valves, fittings and connectors needed to perform pressure testing procedures as needed to isolate the water supply piping. Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for 2 hours.
  - 1 Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for one hour; decrease to 0 psi. Slowly increase again to test pressure and hold for one more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints, or as specified by the local water utility. Remake leaking joints with new materials and repeat test until leakage is within above limits.
- C. Prepare reports for testing activities.

### **3.11 CLEANING**

- A. Clean and disinfect water distribution piping as follows:
  - 1. Purge new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  - 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by that authority, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.

3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities, use procedure described in AWWA C651 or as described below:
  - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine. Isolate system or part thereof and allow to stand for 24 hours.
  - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
  - c. Following allowed standing time, flush system with clean, potable water until chlorine does not remain in water coming from system.
  - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports for purging and disinfecting activities.
- C. Install additional ports, valves, fittings and connectors needed to perform pressure testing and sterilization procedures as needed to isolate the water supply piping.

**END OF SECTION 02510**

## **SECTION 02530 - SANITARY SEWERAGE**

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### **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. All work shall conform to the requirements of the Galloway Township Municipal Utility Division.

#### **1.2 SUMMARY**

- A. This Section includes sanitary sewerage outside the building.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for concrete structures.
  - 2. Division 2 Section "Earthwork".
  - 3. Division 2 Section 02050.

#### **1.3 DEFINITIONS**

- A. PVC: Polyvinyl chloride plastic.
- B. DIP: Ductile iron pipe.

#### **1.4 PERFORMANCE REQUIREMENTS**

- A. Gravity-Flow, Nonpressure Piping Pressure Ratings: At least equal to system test pressure.

#### **1.5 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Cleanouts.
  - 2. Manholes and Castings.
- B. Shop Drawings: Include plans, elevations, details, and attachments for the following:
  - 1. Precast concrete manholes, including frames and covers.
  - 2. Cast-in-place concrete manholes and other structures, including frames and covers.

- C. Coordination Drawings: Show manholes and other structures, pipe sizes, locations, and elevations. Include details of underground structures and connections. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.
- D. Design Mix Reports and Calculations: For each class of cast-in-place concrete.
- E. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Do not store plastic structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

## **1.7 PROJECT CONDITIONS**

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
- B. Locate existing structures and piping to be closed and abandoned.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
- D. Notify not less than two days in advance of proposed utility interruptions.
- E. Do not proceed with utility interruptions without written permission.

## **0.8 QUALITY ASSURANCE**

- A. Testing and inspection service for quality control testing during sanitary sewer system construction will be coordinated by the contractor in accordance with Specification Section 02050.
- B. Schedule inspections with the local plumbing sub-code official as required.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Charlotte Pipe
2. CertainTeed
3. JM Eagle
4. Cresline
5. or approved equal

B. Manufacturers: Provide products by one of the following or approved equal:

1. Cleanouts:
  - a. Josam Co.
  - b. McWane, Inc.; Tyler Pipe; Wade Div.
  - c. Smith: Jay R. Smith Mfg. Co.
  - d. Watts Industries, Inc.; Ancon Drain Div.
  - e. Watts Industries, Inc.; Enpoco, Inc. Div.
  - f. Zurn Industries, Inc.; Hydromechanics Div.
  - g. Or approved equal

## 2.2 PIPES AND FITTINGS

A. Ductile Iron Gravity Sanitary Sewer Pipe

1. Class 52 D.I.P. with mechanical gasketed joints in accordance with ANSI/AWWA C111/A21.11.

B. PVC Sewer Pipe and Fittings: According to the following:

1. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35 of Sch40, for solvent-cemented or gasketed joints.
  - a. Gaskets: ASTM F 477, elastomeric seals.

## 2.3 MANHOLES

A. Heavy-Traffic Precast Concrete Manholes: ASTM C 913; designed according to ASTM C 890 for A-16 (AASHTO H-20), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.

1. Ballast: Increase thickness of one or more precast concrete sections or add concrete to structure, as required to prevent flotation.
2. Gaskets: Rubber.
3. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and cover.
4. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
5. Steps: Manufactured from deformed, 1/2-inch steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.

6. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- C. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, ductile-iron castings designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch diameter cover. Include indented top design with lettering "SANITARY SEWER" cast into cover. Acceptable products are manufactured by Campbell Foundry, Neenah Foundry, or approved equal.

## **2.4 CONCRETE**

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.
- C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio. Include channels and benches in manholes.
1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: 1 percent through manhole.
  2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: 4 percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious materials ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.
- E. Acceptable products are manufactured by Modern Concrete, Oldcastle Precast, Flemington Precast & Supply, or approved equal.

## **2.5 PROTECTIVE COATINGS**

- A. Description: One- or two-coat, coal-tar epoxy; 15-mil minimum thickness, unless otherwise indicated; factory or field applied to the following surfaces:
1. Concrete Manholes: On exterior surface.

2. Manhole Frames and Covers: On entire surfaces.

## **2.6 CLEANOUTS**

- A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug. Use units with top-loading classifications according to the following applications:
  1. Light Duty: In earth or grass foot-traffic areas.
  2. Medium Duty: In paved foot-traffic areas.
  3. Heavy Duty: In vehicle-traffic service areas.
  4. Extra-Heavy Duty: In roads.
  5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.
- B. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping. Install heavy duty cast iron cover (as per detail) when located in areas prone to vehicular traffic.

## **PART 3 EXECUTION**

### **3.1 EARTHWORK**

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

### **3.2 IDENTIFICATION**

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
  1. Use warning tape or detectable warning tape over ferrous piping.
  2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### **3.3 PIPING APPLICATIONS**

- A. General: Include watertight joints.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.
- C. Gravity-Flow Piping: Use the following:

1. NPS 4 and NPS 6: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.
2. NPS 4 and NPS 6: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.

### **3.4 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS**

- A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
  1. Use the following pipe couplings for nonpressure applications:
    - a. Sleeve type to join pipe of same size, or with small difference in OD.
    - b. Increaser/reducer sleeve type to join piping of different sizes.
    - c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

### **3.5 INSTALLATION, GENERAL**

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
  1. Install piping pitched down in direction of flow, at slopes indicated on the plans.
  2. Install piping with 36-inch minimum cover, unless otherwise indicated.
  3. Extend sanitary sewerage piping and connect to building's sanitary drains, of sizes and in locations indicated. Provide couplers/adapters as needed. Terminate piping as indicated.

### **3.6 PIPE JOINT CONSTRUCTION AND INSTALLATION**

- A. General: Join and install pipe and fittings according to installations indicated.
- B. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.



- C. PVC Pressure Pipe and Fittings: Join and install according to AWWA M23.
- D. PVC Sewer Pipe and Fittings:
  - 1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
  - 2. Join profile sewer pipe fittings with gaskets according to ASTM D 2321 and manufacturer's written instructions.
  - 3. Install according to ASTM D 2321.
- E. System Piping Joints: Make joints using system manufacturer's couplings, unless otherwise indicated.
- F. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.
- G. Install with top surfaces of components, except piping, flush with finished surface.

### **3.7 MANHOLE INSTALLATION**

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.
- C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 2 inches above finished surface elsewhere, unless otherwise indicated.
- D. Install precast concrete manhole sections with gaskets according to ASTM C 891.
- E. Construct cast-in-place manholes as indicated.

### **3.8 CONCRETE PLACEMENT**

- A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

### **3.9 CLEANOUT INSTALLATION**

- A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding grade in lawn areas and flush in sidewalk and pavement areas. Also used heavy duty cover in pavement areas subjected to vehicular loading.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

### 3.10 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
  - 1. Place plug in end of incomplete piping at end of day and when work stops.
  - 2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.
  
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
  - 1. Submit separate reports for each system inspection.
  - 2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  - 4. Re-inspect and repeat procedure until results are satisfactory.
  
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects. Coordinate testing and inspection work with the plumbing sub-code official as required. Include contractor's materials testing and inspection company in all test procedures and daily inspection requirements.
  - 1. Do not enclose, cover, or put into service before inspection and approval.
  - 2. Test completed piping systems according to authorities having jurisdiction.
  - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  - 4. Submit separate reports for each test.
  
- D. Sanitary Sewerage: Perform hydrostatic test.
  - 1. Allowable leakage is maximum of 50 gal. per inch of nominal pipe size per mile of pipe, during 24-hour period.
  - 2. Close openings in system and fill with water.
  - 3. Purge air and refill with water.
  - 4. Disconnect water supply.
  - 5. Test and inspect joints for leaks.
  
- E. Sanitary Sewerage: Perform air test according to UNI-B-6.
  - 1. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.
  - 2. Manholes: Perform hydraulic test according to ASTM C 969.
  - 3. Leaks and loss in test pressure constitute defects that must be repaired.

4. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

**END OF SECTION 02530**

## **SECTION 02550 – TRAFFIC SIGNS**

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### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. This work consists of fabricating, furnishing, assembling and erecting signs.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section "Summary of Work" for use of the building and phasing requirements.
  - 2. Division 1 Section "Contract Closeout" for record document requirements.

#### **1.3 MATERIALS**

- A. Materials shall conform to NJDOTSS Section 612.

#### **1.4 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

#### **1.5 QUALITY ASSURANCE**

- A. Contractor Qualifications: Engage an experienced firm that has successfully completed Work similar to that indicated for this Project.

### **PART 2 PRODUCTS**

#### **2.1 EXTERIOR SIGNS:**

- 1. Accessible parking signs, directional signs to accessible entrances, barrier free loading zone signs and traffic control signs, etc. 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 Engineer / Architect from manufacturer's standard.
  - a. Provide aluminum interlocking brackets and bolt/nut sets.

## **2.2 MANUFACTURERS**

A. Acceptable Manufacturers for Highway Traffic signs include:

1. Hall Signs, Inc.
2. Road Safe, Inc.
3. Lyle Signs, Inc.
4. Or approved equal

## **PART 3 EXECUTION**

### **3.1 CONSTRUCTION**

- A. Regulatory and warning signs shall be fabricated of flat aluminum sheets and shall be covered with Type II reflective sheeting. Legends, borders, and accessories shall be Type B. Signs shall be fabricated in accordance with NJDOTSS Section 612.
- B. The placement of signs shall be adjusted if they create interference with sidewalk area. Sites at which the signs are to be erected shall be inspected immediately after grading of the area and prior to determining the sign post lengths. The bottom of signs shall be located not less than five (5) feet above the surface when located in lawn areas not subject to pedestrian traffic and seven (7) feet when subject to pedestrian traffic in the vicinity of the sign.
- C. Signs shall be mounted on "U" sign supports.
- D. Before final inspection, all sign faces and support surfaces shall be cleaned of all foreign matter. Necessary measures shall be taken to provide that all signs, sign supports and signs sites are in good condition and have a good appearance.

**END OF SECTION 02550**

## **SECTION 02617 – PAVEMENT STRIPES AND MARKINGS**

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### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. This work consists of applying white, blue or yellow traffic and pavement thermoplastic markings.
  - 2. The plans show the location of linework, pavement markings, lettering and other symbols to be constructed. Existing pavement markings, where pavement areas are being reconstructed in-kind, shall be restored to original configuration, unless noted otherwise on the plans.
  - 3. Paint curbing to match existing curb coloring denoting “no parking areas” and barrier free (ADA) parking stalls. Scrape and re-paint existing painted curb to a “Like new” condition.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section "Summary of Work" for use of the building and phasing requirements.
  - 2. Division 1 Section "Contract Closeout" for record document requirements.

#### **1.3 MATERIALS**

- A. Materials for Pavement Stripes or Markings shall conform to NJDOTSS Section 610. Materials for Thermoplastic Traffic markings shall conform to NJDOTSS Section 610.

#### **1.4 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

#### **1.5 QUALITY ASSURANCE**

- A. Contractor Qualifications: Engage an experienced firm that has successfully completed Work similar to that indicated for this Project.

### **PART 2 PRODUCTS (Not Applicable)**

## **PART 3 EXECUTION**

### **3.1 CONSTRUCTION**

- A. Surface preparation shall conform to NJDOTSS Section 610. All dirt, oil, grease and other foreign material shall be removed from the areas upon which the pavement marking or striping is to be placed.
- B. Thermoplastic Pavement markings shall be applied in accordance with NJDOTSS Section 610 et. seq.
- C. Thermoplastic Pavement markings and striping shall be completed and the material shall be thoroughly set before opening to traffic. Opening road to traffic shall be in accordance with NJDOTSS Section 610.
- D. Should the contractor need to remove any existing striping or markings, in pavement areas that are to be preserved, this work shall be done in accordance with NJDOTSS Section 610.
- E. All markings, and traffic control lettering shall conform with the Manual of Uniform Traffic Control Devices, latest edition.

**END OF SECTION 02617**

## **SECTION 02750 - LANDSCAPING**

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### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Trees.
  - 2. Shrubs.
  - 3. Ground covers.
  - 4. Plants.
  - 5. Lawns: Seeding requirements are found on the Soil Erosion & Sediment Control Plan.
  - 6. Topsoil and soil amendments.
  - 7. Fertilizers and mulches.
  - 8. Stakes and guys.
  - 9. Landscape edgings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 2 Section "Site Clearing" for protection of existing trees and planting, topsoil stripping and stockpiling, and site clearing.
  - 2. Division 2 Section "Earthwork" for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

#### **1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.
  - 1. Manufacturer's certified analysis for standard products.
  - 2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
  - 3. Label data substantiating that plants, trees, shrubs, and planting materials comply with specified requirements.
- C. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.



1. Certification of each seed mixture for sod, identifying sod source, including name and telephone number of supplier.
- D. 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 address of architects and owners, and other information specified.
- E. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.
  1. Analysis of existing surface soil.
- F. Planting schedule indicating anticipated dates and locations for each type of planting.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.
  1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.
- 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.
- C. Provide quality, size, genus, species, and variety of trees and shrubs indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock."
  1. Selection of trees and shrubs purchased under allowances will be made by Architect, who will tag stock at their place of growth before they are prepared for transplanting.
- D. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of existing topsoil.
  1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.
- B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- C. Trees and Shrubs: Deliver freshly dug trees and shrubs. Do not prune before delivery, except as approved by Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees and shrubs during delivery.
  - 1. Immediately after digging bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.
- D. Handle balled and burlapped stock by the root ball.
- E. Deliver trees, shrubs, ground covers, and plants after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist.
  - 1. Heel-in bare-root stock. Soak roots in water for 2 hours if dried out.
  - 2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
  - 3. Do not remove container-grown stock from containers before time of planting.
  - 4. Water root systems of trees and shrubs stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

## **1.6 PROJECT CONDITIONS**

- A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.
- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.

## **1.7 COORDINATION AND SCHEDULING**

- A. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

## **1.8 WARRANTY**

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall

be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

- B. Special Warranty: Warrant the following living planting materials for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.
  - 1. Trees.
  - 2. Shrubs.
  - 3. Ground covers.
  - 4. Plants.
- C. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.
- D. Replace planting materials that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
- E. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

#### **1.9 TREE AND SHRUB MAINTENANCE**

- A. Maintain trees and shrubs by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings. Maintain trees and shrubs for the following period:
  - 1. Maintenance Period: 12 months following Substantial Completion.

#### **1.10 GROUND COVER AND PLANT MAINTENANCE**

- A. Maintain ground cover and plants by watering, weeding, fertilizing, and other operations as required to establish healthy, viable plantings for the following period:
  - 1. Maintenance Period: 6 months following Substantial Completion.

#### **1.11 LAWN MAINTENANCE**

- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
  - 1. Seeded Lawns: 60 days after date of Substantial Completion. (refer to Section 02750 part #3 "execution", 3.019 "maintenance of seeded lawns")

- a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.
- B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches.
  1. Water lawn at the minimum rate of 1 inch per week.
- D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.
- E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.
  1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. of lawn area.

## **PART 2 PRODUCTS**

### **2.1 TREE AND SHRUB MATERIAL**

- A. General: Furnish nursery-grown trees and shrubs conforming to ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully-branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Grade: Provide trees and shrubs of sizes and grades conforming to ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.
- C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.
- D. Label at least 1 tree and 1 shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

### **2.2 SHADE AND FLOWERING TREES**

- A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required.

1. Branching Height: 1/2 of tree height.
- B. Small Trees: Small upright or spreading type, branched or pruned naturally according to species and type, and with relationship of caliper, height, and branching recommended by ANSI Z60.1, and stem form as follows:
  1. Form: Multistem, clump, with 2 or more main stems.
- C. Provide balled and burlapped trees except where bare-root trees are indicated.
  1. Container-grown trees will be acceptable in lieu of balled and burlapped trees subject to meeting ANSI Z60.1 limitations for container stock.

### **2.3 DECIDUOUS SHRUBS**

- A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.
- B. Provide balled and burlapped deciduous shrubs except where bare-root deciduous shrubs are indicated.
  1. Container-grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to meeting ANSI Z60.1 limitations for container stock.

### **2.4 CONIFEROUS EVERGREENS**

- A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, conforming to ANSI Z60.1.
- B. Provide balled and burlapped coniferous evergreens.
  1. Container-grown coniferous evergreens will be acceptable in lieu of balled and burlapped coniferous evergreens subject to meeting ANSI Z60.1 limitations for container stock.

### **2.5 BROADLEAF EVERGREENS**

- A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, conforming to ANSI Z60.1.
- B. Provide balled and burlapped broadleaf evergreens.
  1. Container-grown broadleaf evergreens will be acceptable in lieu of balled and burlapped broadleaf evergreens subject to meeting ANSI Z60.1 limitations for container stock.

## **2.6 TOPSOIL**

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Screen and clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - 2. Dispose of excess topsoil off site in a legal manner.

## **2.7 SOIL AMENDMENTS**

- A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 sieve and a minimum 75 percent passing a No. 60 sieve.
  - 1. Provide lime in the form of dolomitic limestone.
- B. Aluminum Sulfate: Commercial grade, unadulterated.
- C. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.
- D. Perlite: Horticultural perlite, soil amendment grade.
- E. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.
- F. Peat Humus: For acid-tolerant trees and shrubs, provide moss peat, with a pH range of 3.2 to 4.5, coarse fibrous texture, medium-divided sphagnum moss peat or reed-sedge peat.
- G. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
  - 1. When site treated, mix with at least 0.15 lb of ammonium nitrate or 0.25 lb of ammonium sulfate per cu. ft. of loose sawdust or ground bark.
- H. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.
- I. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- J. Water: Potable.

## **2.8 FERTILIZER**

- A. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

## **2.9 MULCHES**

- A. Wood-fiber or paper fiber mulch. Shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1500 lbs. per acre (or as recommended by the product manufacturer) and may be applied by manually. This mulch shall not be mixed in the tank with seed. Use is limited to flatter slopes and during optimum seeding periods in spring and fall.
- B. Pelletized mulch. Compressed and extruded paper and/or wood fiber product, which may contain co-polymers, tackifiers, fertilizers and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturer's recommendations. Mulch may be applied by hand at the rate of 60-75 lbs/1000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

## **2.10 WEED-CONTROL BARRIERS**

- A. Sheet Polyethylene: Black, 0.006-inch minimum thickness.

## **2.11 EROSION-CONTROL MATERIALS**

- A. Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb per sq. yd. minimum, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

## **2.12 STAKES AND GUYS**

- A. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2 by 2 inches by length indicated, pointed at one end.
- B. Guy and Tie Wire: ASTM A 641, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch in diameter.
- C. Guy Cable: 5-strand, 3/16-inch diameter, galvanized-steel cable, with zinc-coated turn buckles, 3-inch- long minimum, with two 3/8-inch- galvanized eyebolts.

- D. Hose Chafing Guard: Reinforced rubber or plastic hose at least 1/2 inch in diameter, black, cut to lengths required to protect tree trunks from damage.
- E. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

### **2.13 MISCELLANEOUS MATERIALS**

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's instructions.
- B. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 4 inches wide minimum, with stretch factor of 33 percent.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected. Verify the location of underground utilities.

### **3.2 PREPARATION**

- A. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, and secure Architect's acceptance before the start of planting work. Make minor adjustments as may be required.

### **3.3 PLANTING SOIL PREPARATION**

- A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
- B. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.
  - 1. A "Planting Soil Amendments Schedule" is included at the end of this Section.
- C. Retain paragraph below for trees and shrubs.
- D. For tree pit or trench backfill, mix planting soil before backfilling and stockpile at site.
- E. For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.



1. Mix lime with dry soil prior to mixing fertilizer. Prevent lime from contacting roots of acid-tolerant plants.

### **3.4 LAWN PLANTING PREPARATION**

- A. Limit subgrade preparation to areas that will be planted in the immediate future.
- B. Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous materials.
- C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
  1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
  2. Allow for sod thickness in areas to be sodded.
- D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
  1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
  2. Till surface soil to a depth of at least 6 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
  3. Clean surface soil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
  4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1 inch in any dimension, and other objects that may interfere with planting or maintenance operations.
- F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- G. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

### **3.5 GROUND COVER AND PLANT BED PREPARATION**

- A. Loosen subgrade of planting bed areas to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous materials.

- B. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
- C. Till soil in beds to a minimum depth of 8 inches and mix with specified soil amendments and fertilizers.
- D. Remove soil to a minimum depth of 8 inches and replace with prepared planting soil mixture.

### **3.6 EXCAVATION FOR TREES AND SHRUBS**

- A. Pits and Trenches: Excavate with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Loosen hard subsoil in bottom of excavation.
  - 1. Balled and Burlapped Trees and Shrubs: Excavate approximately 1-1/2 times as wide as ball diameter and equal to ball depth, plus the following setting layer depth:
    - a. Setting Layer: Allow 9 inches of planting soil.
- B. Dispose of subsoil removed from landscape excavations. Do not mix with planting soil or use as backfill.
- C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.
- E. Fill excavations with water and allow to percolate out, before placing setting layer and positioning trees and shrubs.

### **3.7 PLANTING TREES AND SHRUBS**

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
  - 1. Place stock on setting layer of compacted planting soil.
  - 2. Remove burlap and wire baskets from tops of balls and partially from sides, but do not remove from under balls. Remove pallets, if any, before setting. Do not use planting stock if ball is cracked or broken before or during planting operation.
  - 3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.
- B. Dish and tamp top of backfill to form a 3-inch high mound around the rim of the pit. Do not cover top of root ball with backfill.

- C. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation and take corrective measures required before wrapping.

### **3.8 TREE AND SHRUB PRUNING**

- A. Prune, thin, and shape trees and shrubs as directed by Architect.
- B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Architect, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are size after pruning.

### **3.9 TREE AND SHRUB GUYING AND STAKING**

- A. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating balls or root masses. Support trees with 2 strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- B. Guying and Staking: Guy and stake trees exceeding 14 feet and more than 3-inch caliper unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches long, driven to grade. Attach flags to each guy wire, 30 inches above finish grade.

### **3.10 PLANTING GROUND COVER AND PLANTS**

- A. Space ground cover and plants as indicated.
- B. Space ground cover and plants not more than 18 inches apart.
- C. Dig holes large enough to allow spreading of roots, and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

### **3.11 SEEDING NEW LAWNS**

- A. Sow seed with a spreader or by hand. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- B. Sow seed at the rates indicated on the plans.

- C. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.
- D. Protect seeded slopes exceeding 1:4 against erosion with erosion-control blankets installed and stapled according to manufacturer's recommendations.
- E. Protect seeded slopes exceeding 1:6 against erosion with jute or coir-fiber erosion-control mesh installed and stapled according to manufacturer's recommendations.
- F. Spread straw mulch uniformly at a minimum rate of 2 tons per acre to form a continuous blanket 1-1/2 inches loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
  - 1. Anchor straw mulch by crimping into topsoil by suitable mechanical equipment.
  - 2. Anchor straw mulch by spraying with asphalt-emulsion tackifier at the rate of 10 to 13 gal. per 1000 sq. ft.. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.
- G. Protect seeded areas against hot, dry weather or drying winds by applying peat mulch within 24 hours after completion of seeding operations. Soak and scatter uniformly to a depth of 3/16 inch thick and roll to a smooth surface.

### **3.12 RECONDITIONING LAWNS**

- A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.
- B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches.
- F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Provide new planting soil as required to fill low spots and meet new finish grades.
- G. Apply seed and protect with straw mulch as required for new lawns.
- H. Water newly planted areas and keep moist until new grass is established.

### **3.13 INSTALLATION OF MISCELLANEOUS MATERIALS**

- A. Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.
  - 1. When deciduous trees or shrubs are moved in full-leaf, spray with antidesiccant at nursery before moving and again 2 weeks after planting.

### **3.14 CLEANUP AND PROTECTION**

- A. During landscaping, keep pavements clean and work area in an orderly condition.
- B. Protect landscaping 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.

### **3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

### **3.16 PLANTING SOIL AMENDMENTS SCHEDULE**

- A. Lawns: Provide soil amendments based upon recommendations made by qualified professionals and recognized standards, subject to Owner's approval:

### **3.17 MAINTENANCE OF SEEDED LAWNS**

- A. Contractor shall maintain seeded lawns until acceptance by the Landscape Architect and Engineer.
- B. The Contractor's responsibility for maintenance is to be continuous to the time of final acceptance of the work. It is to include, but not be limited to, reseeding of areas that have not rooted properly, watering, mowing, weeding and reworking as follows:
  - 1. Reseeding of any bare areas.
  - 2. Proper and adequate watering.
  - 3. Refilling of rain washed gullies and rutted areas.
  - 4. Refertilization and lime application if recommended by soil tests and weed and pest control.
  - 5. Reworking and reseeding of any areas which fail to show a uniform stand or grass shall be done at the Contractor's expense with the same seed mixture applied at the rate originally used and repeated until all areas are covered with a satisfactory stand of grass.
  - 6. Mowing grass and weeks to a height of 1 ½" to 2" when grass attains height of 4" or when growth tends to smother new seedlings. A minimum of three mowings are to be

completed before final inspection and a minimum of three mowings are to be completed after grass has been accepted.

7. If seeded in fall and not given 60 days of maintenance, or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.

**END OF SECTION 02750**

## **SECTION 02751 – CEMENT CONCRETE PAVEMENT**

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### **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 cement concrete pavement for the following:
  - 1. Aprons & ramps.
  - 2. Curbs and gutters.
  - 3. Walkway and pads.
  - 4. Sitework related foundations.
- B. Related Sections include the following:
- C.
  - 1. Division 2 Section "Earthwork" for subgrade preparation, grading, and subbase course.
  - 2. Division 3 Section "Cast-in-Place Concrete" for general building applications of concrete.

#### **1.3 REFERENCES**

- A. "Manual of Standard Practice" of the Concrete Reinforcing Steel Institute.
- B. ACI 318-83 - Building Code Requirements for Reinforced Concrete.
- C. ACI 302 - Guide for Concrete Floor and Slab Construction.
- D. ACI 305R-77 (R1982) - Hot Weather Concreting.
- E. ACI 306R-78 - Cold Weather Concreting.
- F. ASTM A-185-90a - Steel Welded Wire Fabric, Plain, For Concrete Reinforcement.
- G. ASTM A-615-90 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- H. ASTM C-31-90 - Making and Curing Concrete Test Specimens in the Field.
- I. ASTM C-33-90 - Concrete Aggregates.
- J. ASTM C-94-90 - Ready-Mixed Concrete.
- K. ASTM C-143-90 - Slump of Portland Cement Concrete.

- L. ASTM C-150-89 - Portland Cement.
- M. ASTM C-172-90 - Sampling Freshly Mixed Concrete.
- N. ASTM C-173-78 - Air Content of Freshly Mixed Concrete by the Volumetric Method.
- O. ASTM C-231-89 - Air Content of Freshly Mixed Concrete by the Pressure Method.
- P. ASTM C-260-86 - Air-Entraining Admixtures for Concrete.
- Q. ASTM C-309-89 - Liquid Membrane-Forming Compounds for Curing Concrete.
- R. ASTM C-494-86 - Chemical Admixtures for Concrete.
- S. ASTM D-994-71 - Performed Expansion Joint Filler for Concrete (Bituminous Type).
- T. MCTCB - Maine Concrete Testing Certification Board.

#### **1.4 SUBMITTALS**

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials.
- E. Material certificates in lieu of material laboratory test reports when permitted by Engineer. Material certificates shall be signed by manufacturer and Contractor certifying that each material item complies with or exceeds requirements. Provide certification from admixture manufacturers that chloride content complies with requirements.
- F. Submit Shop Drawings showing control joint layout for slabs.
- G. Submit a copy of current MCTCB certification card belonging to the preparer of on-site concrete samples.

#### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed pavement work 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.



- B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
  - 1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.
- C. Testing Agency Qualifications: All concrete construction shall be inspected and tested in accordance with specification Section 02050.
- D. Source Limitations: Obtain each type or class of cement material of the same brand from the same manufacturer's plant and each aggregate from one source.
- E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete for Buildings"; ACI 318, "Building Code Requirements for Reinforced Concrete"; and Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".
- F. Minimum Field Testing Requirements: Field testing of concrete mixes shall be in accordance with Section 903.03.05 of the NJ DOTSS.
- G. Mockups: When/if requested, cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.
  - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
  - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
  - 3. Obtain Architect's approval of mockups before starting construction.
  - 4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
  - 5. Demolish and remove approved mockups from the site when directed by Architect.
  - 6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## **1.6 PROJECT CONDITIONS**

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

## **PART 2 PRODUCTS**

### **2.1 FORMS**

- A. Form materials shall conform to NJDOTSS Section 405.
- B. Form materials shall consist of plywood, metal, metal-framed plywood, steel, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces. Materials shall resist movement during concrete placement and to retain horizontal

straight forms, free of distortion and defects. Use flexible or curved forms for curves of radius of 100 feet or less.

- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

## **2.2 STEEL REINFORCEMENT**

- A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.
- C. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed.
- D. Epoxy-Coated Reinforcement Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, deformed bars.
- E. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.
- F. Plain Steel Wire: ASTM A 82, as drawn.
- G. Epoxy-Coated Wire: ASTM A 884/A 884M, Class A coated, plain steel.
- H. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.
- I. Epoxy-Coated Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain steel bars.
- J. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- K. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- L. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
  - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
  - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer coated wire bar supports.

## 2.3 CONCRETE MATERIALS

- A. General: Use the same brand and type of cementitious material from the same manufacturer throughout the Project.
- B. Portland Cement: ASTM C 150, Type I or II.
  - 1. Fly Ash: ASTM C 618, Class F or C.
- C. Aggregate: ASTM C 33, uniformly graded, from a single source, with coarse aggregate as follows:
  - 1. Class: 4S.
  - 2. Maximum Aggregate Size: 3/4 inches nominal.
  - 3. Do not use fine or coarse aggregates containing substances that cause spalling.
- D. Water: Potable.
- E. Concrete curb and gutters shall conform to NJDOTSS Section 605.02, except that the minimum 28 day compressive strength shall be 4000 psi.
- F. Concrete sidewalks, aprons, ramps, pads, and other miscellaneous flatwork shall conform to NJDOTSS Section 607.02, except that the minimum 28 day compressive strength shall be 4000 psi.

## 2.4 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Air-entrained concrete shall be used where concrete is exposed to the weather.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water Reducing Admixture: "Eucon 75" by The Euclid Chemical Company, Polyheed Non-Chloride by Master Builders, WRDA with Hycol by Grace Construction Products, or Platocrete 160" by Sika Chemical Corporation or approved equal. The admixture shall conform to ASTM C-494, Type A, and not contain more chloride ions than are present in municipal drinking water.
- D. Non-Corrosive, Non-Chloride Accelerator: "Accelguard80" by The Euclid Chemical Co., or approved equal. The admixture shall conform to ASTM C-494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory (or at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.
  - 1. Subject to compliance with requirements of the Contract Documents, manufacturers offering products which may be incorporated in work include the following:
    - a. Accelguard80" by The Euclid Chemical Co.

- b. "Plastocrete 161FL", by Sika
  - c. or approved equal.
- E. Air Entraining Admixture: Conform to ASTM C-260, "Darex AEA" as manufactured by The Construction Products Division of W.R. Grace & Company, 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. "Darex AEA" by WR Grace Co.
    - b. "Eucon Air Mix 250", by Euclid
    - c. or approved equal.
- F. Prohibited Admixture: Calcium chloride, thiocyanates or admixture containing more than 0.05% chloride ions are not permitted.
- G. Certification: Written conformance to the above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Architect.
- H. Curing Paper: Water, reinforced appear; "Orange Label Sisalkraft," as manufactured by the American Sisalkraft Corporation, "Scuf-Champ,," as manufactured by Ludlow Papers, "Flor-Cur W/S," as manufactured by Glas-Kraft, or approved equal.
- I. Moisture Barrier: "J" Pro Vapor Shield, Super Sampson SS4 or Tu Tuff 4, or approved equal.
- J. Concrete Slab Sealer: Prosoco Inc., SLX 100 penetrating sealer, 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. "SLX 100" by Prosoco, Inc.
    - b. "Chemstop WB" by Euclid Co.
    - c. or approved equal.

## 2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation retarder below temporarily reduces moisture loss from concrete surfaces awaiting finishing in hot, dry, and windy conditions. Evaporation retarders are neither curing compounds nor chemical surface retarders used to delay concrete setting.
- E. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- F. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- G. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

- H. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.
- I. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- J. Products: Subject to compliance with requirements, provide one of the following or approved equal:
  - 1. Evaporation Retarder:
    - a. Cimfilm; Axim Concrete Technologies.
    - b. Finishing Aid Concentrate; Burke Group, LLC (The).
    - c. Spray-Film; ChemMasters.
    - d. Aquafilm; Conspec Marketing & Manufacturing Co., Inc.
    - e. Sure Film; Dayton Superior Corporation.
    - f. Eucobar; Euclid Chemical Co.
    - g. Vapor Aid; Kaufman Products, Inc.
    - h. Lambco Skin; Lambert Corporation.
    - i. E-Con; L&M Construction Chemicals, Inc.
    - j. Confilm; Master Builders, Inc.
    - k. Waterhold; Metalcrete Industries.
    - l. Rich Film; Richmond Screw Anchor Co.
    - m. SikaFilm; Sika Corporation.
    - n. Finishing Aid; Symons Corporation.
    - o. Certi-Vex EnvioAssist; Vexcon Chemicals, Inc.
    - p. or approved equal
  - 2. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound:
    - a. AH Curing Compound #2 DR; Anti-Hydro International, Inc.
    - b. Res-X Cure All Resin; Burke Group, LLC (The).
    - c. RX Cure; Conspec Marketing & Manufacturing Co., Inc.
    - d. Day-Chem Rez Cure; Dayton Superior Corporation.
    - e. Kurez DR; Euclid Chemical Co.
    - f. Nitocure S; Fosroc.
    - g. #64 Resin Cure; Lambert Corporation.
    - h. L&M Cure DR; L&M Construction Chemicals, Inc.
    - i. 3100-Clear; W. R. Meadows, Inc.
    - j. Seal N Kure FDR; Metalcrete Industries.
    - k. Rich Cure; Richmond Screw Anchor Co.
    - l. Resi-Chem C309; Symons Corporation.
    - m. Horncure 30; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
    - n. Uni Res 150; Unitex.
    - o. Certi-Vex RC; Vexcon Chemicals, Inc.
    - p. or approved equal
  - 3. Clear Waterborne Membrane-Forming Curing Compound:
    - a. AH Curing Compound #2 DR WB; Anti-Hydro International, Inc.
    - b. Aqua Resin Cure; Burke Group, LLC (The).
    - c. Safe-Cure Clear; ChemMasters.
    - d. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
    - e. Day Chem Rez Cure (J-11-W); Dayton Superior Corporation.
    - f. Nitocure S; Fosroc.

- g. Aqua Kure-Clear; Lambert Corporation.
  - h. L&M Cure R; L&M Construction Chemicals, Inc.
  - i. 1100 Clear; W. R. Meadows, Inc.
  - j. Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
  - k. Rich Cure E; Richmond Screw Anchor Co.
  - l. Resi-Chem Clear Cure; Symons Corporation.
  - m. Horncure 100; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
  - n. Hydro Cure; Unitex.
  - o. Certi-Vex Enviocure; Vexcon Chemicals, Inc.
  - p. or approved equal.
4. White Waterborne Membrane-Forming Curing Compound:
- a. AH Curing Compound #2 WB WP; Anti-Hydro International, Inc.
  - b. Aqua Resin Cure; Burke Group, LLC (The).
  - c. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
  - d. Thinfilm 450; Kaufman Products, Inc.
  - e. Aqua Kure-White; Lambert Corporation.
  - f. L&M Cure R-2; L&M Construction Chemicals, Inc.
  - g. 1200-White; W. R. Meadows, Inc.
  - h. White Pigmented Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
  - i. Rich Cure White E; Richmond Screw Anchor Co.
  - j. Resi-Chem High Cure; Symons Corporation.
  - k. Horncure 200-W; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
  - l. Hydro White 309; Unitex.
  - m. or approved equal.

## 2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Pavement-Marking Paint: Alkyd-resin type; ready mixed; complying with FS TT-P-115, Type I, or AASHTO M 248, Type N. Color: white, yellow or blue.
- C. Glass Beads: AASHTO M 247.
- D. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
- E. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- F. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
  - 1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.

2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

## **2.7 CONCRETE MIXES**

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.
  1. Do not use Owner's field quality-control testing agency as the independent testing agency.
- C. Proportion mixes to provide concrete with the following properties:
  1. Compressive Strength (28 Days): 4000 psi.
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
  3. Slump Limit: 3 inches.
    - a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches after adding admixture to plant- or site-verified, 2- to 3-inch slump.
- D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  1. Fly Ash: 25 percent.
  2. Combined Fly Ash and Pozzolan: 25 percent.
  3. Ground Granulated Blast-Furnace Slag: 50 percent.
  4. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
- E. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.
- F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus or minus 1.5 percent:
  1. Air Content: 5.5 percent for 1-1/2-inch maximum aggregate.
  2. Air Content: 6.0 percent for 1-inch maximum aggregate.
  3. Air Content: 6.0 percent for 3/4-inch maximum aggregate.

## **2.8 CONCRETE MIXING**

- A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.
  - 1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixers of 1 cu. yd. or smaller capacity, continue mixing at least one and one-half minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixers of capacity larger than 1 cu. yd. , increase mixing time by 15 seconds for each additional 1 cu. yd.
  - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

#### **3.2 EDGE FORMS AND SCREED CONSTRUCTION**

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

#### **3.3 STEEL REINFORCEMENT**

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.



- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum 2" cover to reinforcement.
- D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

### **3.4 JOINTS**

- A. General: Construct construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
  - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.
  - 1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
  - 2. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
  - 3. Provide tie bars at sides of pavement strips where indicated.
  - 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - 5. Use epoxy bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
  - 1. Locate expansion joints at intervals of 20 feet, unless otherwise indicated.
  - 2. Extend joint fillers full width and depth of joint.
  - 3. Terminate joint filler less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
  - 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
  - 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
  - 6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
  - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
    - a. Radius: 1/4 inch ).
  - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
- E. Edging is included in this Article for its similarity to jointing. Timing of edging after initial floating is critical.
- F. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
  - 1. Radius: 1/4 inch.

### **3.5 CONCRETE PLACEMENT**

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery, at Project site, or during placement.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.
  - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side

forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

- H. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
  - 1. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.
- I. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- J. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
  - 2. Do not use frozen materials or materials containing ice or snow.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- K. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:
  - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  - 2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
  - 3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

### **3.6 CONCRETE FINISHING**

- A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish

surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic for service yard slabs.

### **3.7 SPECIAL FINISHES**

- A. Slip-Resistant Aggregate Finish: Before final floating, apply slip-resistant aggregate finish to pavement surfaces according to manufacturer's written instructions and as follows:
  1. Uniformly spread 25 lb/100 sq. ft. of dampened nonslip aggregate over the surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
  2. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose nonslip aggregate.

### **3.8 CONCRETE PROTECTION AND CURING**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
  1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
  2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy

rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

### 3.9 CONCRETE CURBS

- A. Excavation for curbs shall be made to the required depth and to a width that permits the installation and bracing of the forms. The underlying material shall be shaped and compacted to a firm, even surface. Unstable material shall be removed and replaced with acceptable material which shall be compacted (95% Proctor).
- B. Immediately before placing the concrete, the underlying material shall be thoroughly dampened, and the forms given a coating of light oil or other material which can prevent adherence of the concrete to the forms and which does not discolor the concrete. Where removed and used again, the forms shall be thoroughly cleaned and treated each time before using.
- C. The concrete shall be placed immediately after mixing. The edges, sides and faces shall be spaded or vibrated and the surface tamped to compact the concrete thoroughly and bring the mortar to the surface, after which the surface shall be finished smooth and even by means of a wooden float.
- D. Concrete curbs shall be constructed in sections having uniform lengths of 20 feet. The length of these sections may be reduced where necessary for closures but no section less than 6 feet will be permitted. The forms on the face of all curb shall be removed as soon as the concrete holds its shape and the surface shall then be finished with a fine hair brush to a smooth and even finish. Plastering will not be permitted. The top edges of curb shall be rounded. Edges where expansion joint material has been placed shall be finished with an edging tool having a radius of not over  $\frac{1}{4}$  inch.
- E. As soon as the forms are removed, the concrete shall be covered with wet burlap if finishing prevents the immediate application of curing compounds. The concrete shall remain covered until it is to be finished, at which time the wet burlap shall be removed from that amount of concrete that can be immediately finished. As soon as finishing is complete, curing compound shall be applied.
- F. Any exposed surface against which some rigid type of construction is to be made shall be left smooth and uniform so as to permit free movement of the curb.
- G. All tool marks shall be removed with a wetted brush or wooden float and the finished surface shall present a uniform appearance.
- H. Care shall be taken to minimize damage to previously constructed areas. Any damage shall be repaired without additional compensation.
- I. Expansion joints shall be provided opposite joints in abutting concrete surface courses and at approximately equal distances of not more than 20 feet between joints. Joints shall be filled with preformed expansion joint filler,  $\frac{1}{2}$  inch, which shall be flush with the top and face. Between concrete curbs and concrete surface or base course,  $\frac{1}{2}$  inch, preformed expansion joint filler shall be installed and the joint shall be sealed with hot-poured joint sealer.

- J. The curb shall be protected until finally accepted. During this period, any damage caused by construction operation shall be repaired without additional compensation.
- K. When the curb is to be constructed upon concrete, all dirt, bituminous material, and other loose or adhering matter shall be removed from the surface. The curb shall be doweled with steel dowels. The diameter of holes drilled in concrete shall be not more than  $\frac{3}{4}$  inch greater than the diameter of dowels. The dowels shall be set in grout. Transverse joints in doweled curb shall be installed directly over transverse joints and over definite cracks in the concrete. Additional joints shall be installed between slab joints and cracks so as to divide the curb into sections of approximately equal lengths of not more than 20 feet. The joints shall be constructed as specified elsewhere herein.

### **3.10 CONCRETE PADS, SIDEWALKS, RAMPS AND APRONS**

- A. Set forms accurately to line, radius and grade. Securely stake to prevent movement.
- B. Thoroughly consolidate and screed to thickness of 4" or 6" except as otherwise shown.
- C. Set premolded joints at equal spacing, maximum 20' on center. Provide joint filler against foundation walls and other vertical surfaces. Set  $\frac{3}{4}$ " below level of finish slab for walks with concrete finish and flush where brick finish is shown.
- D. Trowel concrete to remain exposed and finish with a fine wet broom drawing across the surface of walk. Provide transverse tooled control joints between expansion joints in intervals equal to 5 feet by 5 feet sidewalk width, except as otherwise shown. Tool all edges including both sides of expansion joints. Provide expansion joints every 20 feet.
- E. Damp cure all concrete in accordance with requirements specified.
- F. Protect surface from damage from pedestrians and traffic until fully cured.
- G. Cure and seal exposed surfaces of walks in accordance with requirements specified.

### **3.11 FIELD QUALITY CONTROL**

- A. Testing & Inspection Agency: Refer to Section 02050.
- B. Testing Services: Testing shall be performed according to the following requirements:
  - 1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C 172, except modified for slump to comply with ASTM C 94.
  - 2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
  - 3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each set of compressive-strength specimens.
  5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
  6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. . One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
  7. When frequency of testing will provide fewer than five compressive-strength tests for a given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
  9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls below specified compressive strength by more than 500 psi .
- C. Test results shall be reported in writing to Owner's Representative, Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as the sole basis for approval or rejection.
- E. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

### **3.12 REPAIRS AND PROTECTION**

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Drill test cores where directed by Architect 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. 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. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

**END OF SECTION 02751**



## SECTION 02800 – SITE RESTORATION

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### PART 1 GENERAL

#### 1.1 SUMMARY

- A. The work under this section shall consist of furnishing all labor, equipment and materials for performing site restoration activities to return the site to pre-construction or improved conditions as described in the Specifications and shown on the Construction Drawings.
- B. Related Sections
  - 1. Section: "Site Clearing"
  - 2. Section: " Earthwork"

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Topsoil

The Contractor shall spread sufficient amounts of topsoil material required to provide a minimum of five inches of topsoil over disturbed areas to be vegetated. The Contractor shall prepare topsoil that meets the requirements of Section 02750.

- B. Fertilizers

The Contractor shall furnish sufficient amounts of fertilizer, which may be either fluid or dry formulations of commercial carriers of available plant nutrients. The fertilizer shall contain total nitrogen, available phosphoric acid, and soluble potash in the ratio of 10-20-10. The Contractor shall submit the manufacturer's label or certificate indicating compliance with specifications to the Construction Oversight Engineer and for review and approval. During the work, the Construction Oversight Engineer reserves the right to reject any material that has become caked or otherwise damaged.

- C. Mulch

The Contractor shall furnish sufficient amounts of mulch. The Contractor may use either hay or straw for mulch. Hay for mulching shall be mowings of acceptable herbaceous growth free from noxious weeds. Straw for mulching shall be stalks of oats, wheat, rye or other approved crops free from noxious weeds.

- D. Asphalt

The Contractor shall furnish sufficient amounts of each asphalt pavement layer. The subbase course shall be dense graded aggregate (DGA) conforming to the requirements of Section

02200. The asphalt base course shall be NJDOT HMA 19M64. The asphalt surface course shall be NJDOT specification HMA 9.5M64

E. Fence

New fence shall be installed per plan details and reference specifications. The Contractor shall reinstall existing fencing or provide new fencing to replace the type of fence removed to support remedial activities to restore fencing to original or "like new" condition. Fencing shall be replaced with a similar style, height and type to the existing fencing.

## 2.2 EQUIPMENT

The Contractor shall furnish all equipment required to complete the work of this Section.

## PART 3 EXECUTION

### 3.1 RESTORATION OF THE SITE

The Contractor shall provide a final layer of material over excavation areas consistent with the existing conditions (i.e., quarry process, asphalt, etc.) in accordance with the requirements below.

### 3.2 Landscaped Areas

A. Topsoil Placement

Prior to the placement of topsoil, the subgrade soil shall be loosened to a depth of two inches and graded so that it will be parallel to the proposed finished grade. Topsoil shall be spread, raked and compacted to form, after settlement, smooth draining grades. The minimum depth of topsoil after compaction shall be six inches.

B. Fertilizer Application

Fertilizer shall be evenly spread over the surface of soil in areas as directed. Rates of application shall be as required to promote tree growth. Tests required to determine rate of fertilizer application shall be made by the Contractor and the rate accepted by the Engineer. Any method of application that will ensure an even distribution will be acceptable.

C. Mulching

The surface of areas where mulch is to be applied shall be cleared of stones, stumps, wire, and other obstacles that might hinder subsequent landscaping operations. The ground shall be harrowed or disked to produce a state of suitable tillage.

The mulch shall be spread uniformly in a continuous blanket of sufficient thickness to completely hide soil from view. Mulch may be spread before or not later than three days after placement of topsoil unless otherwise approved. Anchorage to hold mulch in place may be applied by an approved method during mulching operation or subsequently.

- D. The Contractor shall care for landscaped areas until final acceptance. Such care shall consist of providing protection against traffic by approved warning signs or barricades, and repairing areas damaged following seeding or mulching operations due to wind, water, fire or other causes. Damaged areas shall be repaired to re-establish condition and grade of area prior to seeding and shall be re-fertilized, re-seeded, and re-mulched as specified herein. The Contractor shall keep seeded areas mowed until acceptance by cutting to a height of three inches when growth reaches six inches, or as directed.
- E. When, in the judgment of the Construction Oversight Engineer, at any time prior to acceptance, any area which has been landscaped fails to produce a satisfactory growth of grass after a suitable period of time has elapsed, the Contractor shall re-plant, re-fertilize and re-mulch such areas as specified.

### **3.3 ASPHALT COVER**

- A. For areas requiring a final asphalt cover, the Contractor shall perform asphalt installation in accordance with the minimum layer thicknesses shown on the Construction Drawings and Section 2400. The subbase course shall be dense graded aggregate conforming to the requirements of Section 2200. The asphalt base course shall be NJDOT HMA 19M64. The asphalt surface course shall be NJDOT HMA 9.5M64. The Contractor shall install all asphalt courses based on the requirements of the NJDOT Standard Specifications, latest edition.
- B. The Contractor shall install the asphalt to the existing cut line of the asphalt. At the joint between the new asphalt and the existing pavement, the Contractor shall provide a smooth transition.
- C. All pavement and subbase restoration courses shall be at least as thick as adjacent surfaces they adjoin.

### **3.4 CLEANUP OF THE PROJECT SITE**

- A. The Contractor shall perform final cleanup of all work areas and adjacent areas upon completing the site restoration (removal of tarps; broom cleaning paved surfaces; removal of any traffic barriers, etc.).
- B. The cleaning work shall also include the following:
  - 1. Repair of any erosion or runoff related damage.
  - 2. Grading and final cover, as required, of all areas used by the contractor.
  - 3. Removal of all materials such as excess construction material, wood, debris and any other foreign material; and
  - 4. Removal of all construction equipment;
- C. Final cleanup of all work areas and adjacent areas upon completing the site restoration (removal of tarps; broom cleaning paved surfaces; removal of any traffic barriers, etc.); removal of all constructed related equipment and material that is not part of the final site

design; and all other items and services required for site restoration for which pay items are not provided elsewhere in this Contract.

**END OF SECTION 02800**

## **SECTION 02820 – CHAIN LINK FENCE**

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### **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 black vinyl coated chain link fencing with heavy duty privacy slats, including accessories and concrete footings for posts.
- B. Coordinate fence and gate work to insure compatibility between new and existing fencing materials and to avoid installation conflicts.

#### **1.3 RELATED SECTIONS**

- 1. Section 03300 – Concrete Mix Design

#### **1.4 REFERENCED STANDARDS**

- A. ASTM American Society for Testing and Materials:
  - 1. Standards and Test Methods referenced in Part 2 - Products.

#### **1.5 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and installation instructions for metal fencing, fabric, gates and accessories. Include privacy slat cut sheets.
- B. Compliance: Not used.
- C. Color Selection: Black vinyl coated fabric, posts and rails.
- D. Shop Drawings: Submit sample of fence section for each height specified.
- E. Provide shop drawing depicting the means of installing fencing located in concrete curbs, walks or slabs.

#### **1.6 QUALITY ASSURANCE**

- A. Provide chain link fences as complete units from a single source, including necessary erection accessories, fittings, and fastenings.

## **1.7 REGULATORY REQUIREMENTS**

- A. Comply with the applicable provisions of codes, standards and specifications referenced in this section.

## **PART 2 PRODUCTS**

### **2.1 ACCEPTABLE 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. Steel Fencing and Fabric:
    - a. American Fence Corp.
    - b. Anchor Fence, Inc.
    - c. United States Steel. (Cyclone Fence Division)
    - d. National Fence Co.
    - e. or approved equal.

### **2.2 GENERAL**

- A. Dimensions indicated for pipe, roll-formed, and H-sections are outside dimensions, exclusive of coatings.

### **2.3 STEEL FABRIC**

- A. Fabric: Number 9 gage (0.418 inch) steel wires, 2 inch mesh, with top and bottom selvage. Provide one piece fabric widths for fencing up to 12 feet high.
  - 1. Fabric Finish: Galvanized, ASTM A392, Class II, with not less than 2.0 oz. zinc per sq. ft. of surface. Plastic-coated, color black, 2" mesh as required by plan details.
    - a. Comply with ASTM F668, Class 2, except provide fabric with diameter (gage) of core wire equivalent to fabric diameter specified when measured prior to application of non-metallic coating.

### **2.4 FRAMING AND ACCESSORIES**

- A. General: Galvanized steel, painted black, ASTM A120 or A123, with not less than 1.8 oz. zinc per sq. ft. of surface.
  - 1. Fittings and Accessories: Galvanized, ASTM A153, with zinc weights per Table I.
- B. End, Corner and Pull Posts: Refer to drawing detail(s) for post sizes.
- C. Line Posts: Refer to drawing detail(s) for post sizes.

D. Gate Posts:

1. For swing gates, provide posts for supporting each gate leaf for nominal gate widths as follows:

<u>Leaf Width</u>	<u>Gate Post</u>	<u>lbs./lin.ft.</u>
Up to 6 feet	3.5 inches x 3.5 inches roll-formed section or 2.875 inches OD pipe	4.85 5.79

- E. Top Rail: 1.66 inches OD pipe, 2.27 lbs. per ft. or 1.625 inches x 1.25 inches roll-formed sections, 1.35 lbs. per ft. Manufacturer's longest lengths, with expansion type couplings, approximately 6 inches long, for each joint. Provide means for attaching top rail securely to each gate corner, pull and end post.
- F. Bottom Rail: Same as top rail, except not continuous.
- G. Post Brace Assembly: Adjustable brace at end and gate posts and at both sides of corner and pull posts, with horizontal brace at mid-height of fabric. Use same material as top rail for brace; truss to line posts with 0.375 inch diameter rod and adjustable tightener.
- H. Post Tops: Pressed steel, wrought iron, or malleable iron, to form a weather tight closure cap for posts. Provide one cap for each post, except where combination post top caps and barbed wire supporting arms are used. Provide caps with openings for through passage of top rail.
- I. Stretcher Bars: One-piece lengths equal to full height of fabric, with minimum cross-section of 3/16 inch x 3/4 inch. Provide one stretcher bar for each gate and end post, and 2 for each corner and pull post, except where fabric is integrally woven into post.
- J. Stretcher Bar Bands: Steel, wrought iron, or malleable iron. Space not over 15 inches o.c., to secure stretcher bars to end, corner, pull, and gate posts.

**2.5 CONCRETE**

- A. Provide concrete consisting of Portland cement, ASTM C150, aggregates ASTM C33, and clean water. Minimum 28-day compressive strength 2500 psi. Use at least 4 sacks of cement per cu. yd., 1 inch maximum size aggregate, maximum 3 inches slump, and 2 percent to 4 percent entrained air.

**PART 3 - EXECUTION**

**3.1 INSTALLATION IN GROUND**

- A. Do not begin installation and erection before final grading is completed and finish elevations established.
- B. Excavation: Drill or hand excavate (using post hole digger) holes for posts in firm, undisturbed or compacted soil.

1. Excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross-section of post.
  2. Excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface, except to greater depths where indicated.
- C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing. Extend concrete footings to be flush with finish grade, except extend footings for swing gate posts to underside of bottom hinge. Trowel tops of footings to a crown to shed water away from posts.
1. Set keeps, stops, sleeves and other accessories into concrete.
  2. Grout-in posts set into sleeved holes, concrete construction, or rock excavations, with non-shrink Portland cement grout.
  3. Allow concrete to attain at least 75 percent of its minimum 28-day compressive strength and wait at least seven (7) days after placement before installing rails, tension wires, barbed wire, or fabric. Do not stretch and tension fabric and wires, and do not hang gates, until the concrete has obtained its full design strength.
- D. Top Rails: Run rail continuously through post caps, bending to radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer.
- E. Center Rails: Provide where indicated. Install in one piece between posts and flush with post on fabric side, using special offset fittings where necessary.
- F. Install braces so posts are plumb when diagonal rod is under proper tension.
- G. Fabric: Leave approximately 2 inches between finish grade and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.
- H. Stretcher Bars: Thread through or clamp to fabric 4 inches o.c., and secure to posts with metal bands spaced 15 inches o.c.
- I. Tie Wires: Use U-shaped wire, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing. Tie fabric to line posts with wire ties 12 inches o.c. Tie fabric to rails and braces with wire ties 24 inches o.c. Tie fabric to tension wires with hog rings 24 inches o.c.
- J. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

### **3.2 PROTECTION AND REPAIR**

- A. Protect installed fencing from damage until final acceptance. Install barriers or attach protective materials at posts and other points subject to impact or abrasion.



- B. Repair damaged coatings by recoating with high zinc dust content paint for repair of galvanizing, or by compatible and equivalent coating for repair of vinyl. Match adjacent coating, and apply per manufacturer's directions.
- C. Replace any metal components distorted in the course of construction work. Remove and replace concrete footings displaced by impact.

**END OF SECTION 02820**

## **SECTION 02830 - CONSTRUCTION FENCING**

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### **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 SUMMARY**

- A. Install temporary six (6) foot high temporary light gage metal construction fencing to enclose all active work areas where final grading has not been completed. Provide dust screen on the south and east side fencing that faces the school building and parking lot/driveway. It is not necessary to install dust screen on fencing that is facing the wet ponds. All active work areas shall be fenced. Fencing may be moved as work is completed.
- B. Include the maintenance of all required gates, latches, chains, locks, and hardware needed to secure the construction fencing around all work areas.
  - 1. Furnish extra sets of gate lock keys to the Construction Manager and Owner.

#### **1.3 RELATED SECTIONS**

- 1. Division 02 Section "Site Clearing"
- 2. Division 02 Section "Selective Demolition"

### **PART 2 PRODUCTS**

#### **2.1 CONSTRUCTION FENCING**

- A. Maintain, supplement, move, and re-install, as required, temporary metal construction security fence, six (6) feet high, with dust screen at selected areas, and lockable access gates at appropriate locations that facilitate work and control site access per the construction plans. The Owner's representative reserves the right to determine the appropriate amount of fencing needed to maintain construction site security and safety, and the Contractor shall provide and maintain the required temporary construction fencing as needed. The temporary chain link construction fencing shall meet or exceed the following specifications.

- 1. Minimum 11 gage mesh, 2" square
- 2. Minimum post diameter: 1 1/2" (or larger as dictated by fence height)
- 3. Minimum Post thickness: 0.065"
- 4. Rails as needed to accommodate windscreens.
- 5. Mesh to be tied every 12" along posts and rails.

- 6. Fence shall be “post in ground” style.
- 7. Fence to be provided with windscreen (for dust control) material to full height of fence.
- B. All fencing components shall be free of burrs and other jagged edges that could cause bodily harm.
- C. All fence shall be securely anchored to prevent collapse, movement or dislocation.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. Provide and maintain temporary construction security fencing around all work areas, including all gates and locking hardware.
- B. Inspect and maintain fence in a safe and secure condition throughout construction.
- C. Construction fencing may be moved and re-installed around the construction site as the work progresses, to insure that the construction site is secured at all times until substantial completion (or longer if construction site conditions warrant at no additional cost). At no time shall the construction site be left open and unsecured by temporary construction fencing.
- D. Construction fencing may be removed when the site work is completed and all permanent fencing, railings, guards, and other safety measures are in place. In the event that the construction schedule is extended, the fencing rental agreement shall also be extended at no additional cost. The Owner reserves the right to require the temporary fencing to remain in place as needed to safeguard an undesirable site condition, until said condition is remedied to the satisfaction of the construction official and the site is deemed to be in safe and orderly condition.

**END OF SECTION 02830**

## **SECTION 03300 – CAST-IN-PLACE CONCRETE**

### **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 drawings.
- B. Concrete paving and walks 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:
  - 1. ACI 301 "Specifications for Structural Concrete for Buildings".
  - 2. ACI 318 "Building Code Requirements for Reinforced Concrete".
  - 3. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice".
- B. Concrete Testing Service: 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. Preinstallation Conference: Conduct conference at a Project site to comply with requirements in Division 01 Section "Project Management and Coordination".
  - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
    - a. Contractor's superintendent.
    - b. Independent testing agency responsible for concrete design mixtures.
    - c. Ready-mix concrete manufacturer.
    - d. Concrete subcontractor.
    - i. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold and hot weather concreting procedures, curing procedures, construction contraction and isolation joints and joint filler strips, semirigid joint fillers, forms and form removal limitations, vapor retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures and concrete protection.

## **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. Light Weight Aggregates: ASTM C330 and as herein specified, coarse shale, slate or slag aggregate, free from expanded clay
- D. Water: Drinkable.
- E. 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.
- F. 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. Or approved equal.
- G. 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 86"; Sika Corporation.
  - e. Or approved equal.
  
- H. 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. "Plastocrete 161FL" or "SikaSet NC"; Sika Corporation
    - d. Or approved equal.
  
- I. 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.
  
- J. 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 ASTM C-578 Type IV: min. 25 psi compressive strength ASTM D 1621: k value of 0.20 ASTM C 518: 0.30% maximum water absorption ASTM C272: 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:
    - a. Dow Chemical Co: Midland MI
    - b. VC Industries/V.5 Gypsum: Chicago, IL.
    - c. GreenGuard XPS: Pactive LLC: Austin, TX
    - d. Or approved equal.

- B. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
  2. Products: Subject to compliance with requirements provide one of the following:
  3. Non-metallic
    - a. "Euco-NS"; Euclid Chemical Co.
    - b. "Duragrout"; L&M Construction Chemicals, Inc.
    - c. "Masterflow 713"; Master Builders
    - d. "Five Star Grout"; U.S. Grout Corporation.
    - e. 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.
  4. Or approved equal.
- E. Clear curing and sealing compound (VOC Compliant): The compound shall have 30% solids content minimum, and will not yellow under ultraviolet light after 500 hours of test in accordance with ASTM C-1315 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 Aqua-Cure VOX" by Euclid Chemical Co.
  2. Product: "Dress & Seal WB30" by L&M Construction Chemicals, Inc
  3. Product: "Kure-n-Seal 30 VOC" by Sonneborne
  4. Or approved equal.
- F. Vapor Barrier: Provide vapor barrier which conforms to ASTM E1745, Class A. The membrane shall have a water-vapor transmission rate no greater than 0.01 gr./ft<sup>2</sup>/hr/inch Hg when tested in accordance with ASTM E96. The vapor barrier shall be placed over prepared base material where indicated below slabs on grade. Vapor barrier shall be no less than 15 mil thick. Installation of vapor barrier to comply with ASTM E1643.
1. Product: Stego Wrap (15 mil) Vapor Barrier by Stego Industries LLC
  2. Product: VaporBlock (15 mil) by Raven Industries
  3. Product: Zero Perm by Alumiseal
  4. Product: Premoulded Membrane with PLASMATIC CORE by W.R. Meadows.
  5. Or approved equal.



## 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 and Structural Engineer 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 and schedules:
- D. For normal weight aggregate mixes: 3000 psi 28-day compressive strength; W/C ratio, 0.51 maximum, 3500 psi 28-day compressive strength W/C ratio, 0.47 maximum.
- E. 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.
- F. 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
- G. 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 C94, 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. Use "SOFFCUT" saw to cut joints in slab. Joint to be cut the same day as the pour.
- C. Joint filler and sealant materials are specified in Division-7 sections of these specifications.

### **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.

### **3.5 CONCRETE PLACEMENT**

- A. Preplacement 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 "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 of Ff18 - Ff15. 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 of Ff20 - Ff17. 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 301 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 4" 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 3" 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 ceramic or quarry tile, 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 owner will employ a testing laboratory to perform the following tests, inspect formwork and reinforcement placement and to submit test reports.
- 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**

## **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. Ground Face Architectural CMU
  - 3. Concrete masonry bond beams.
  - 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 08410 - Aluminum/FRP Doors and Aluminum Framing Systems.
  - 8. 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-ups for the following types of masonry in sizes of approximately 4 feet long by 6 feet high by full thickness, including provisions for 16" wide by 24" high opening with appropriate steel or masonry lintels, face and back-up wythes, cavity, insulation, horizontal reinforcement, ties, through wall flashing, weep holes, air/vapor barrier, mortar net and spandrel steel beam / lintel flashing as well as any other wall components and accessories in accordance with attached sketch and as directed by the Architect in Field. **See sketch of sample Mock-Up Panel at the end of this Section.**
1. Each type of exposed unit masonry work.
  2. Typical exterior face brick wall.
  3. Typical interior brick wall.
  4. Where masonry is to match existing, erect panels parallel to existing surface.
- E. Engineered Masonry for Seismic Requirements: Where indicated, provide masonry material and construction for engineered masonry work to conform to the requirements of ACI 530/ASCE 5/TMS 402, the International Building Code, and in compliance with requirements for Seismic Performance Category assigned to the construction documents for this project.
- 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. Unit masonry samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work.
  2. 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.

### **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. NCMA TEK Bulletins.
  - 13. ASTM E2178 Standard Test Method for Air Permeance of Building Materials
  - 14. ASTM E2357 Standard Test Method for Determining the Air Leakage of Air Barrier Assemblies.
  - 15. ASTM E96 Water Vapor Transmission of Materials.
  - 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. The Contractor shall warrant the exterior walls to be free from leakage due to any natural cause for a period of **five (5) years** from date of final acceptance of the building and he shall, within such period at his own expense, upon written notification from the Owner, pursue such remedial measures as may be necessary to correct any condition of leakage and damage incidental thereto that may develop. The Contractor in signing this Contract accepts the above conditions. In so doing, he also agrees either that the materials and methods specified herein are such as to insure the results required or that he will, at no additional expense, furnish such additional or alternative items of labor and materials (or both) as may be necessary to accomplish the stated intent of the Contract.

## **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. Concrete and Architectural 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.
  2. 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 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. Where special patterns are indicated, provide units with exposed faces matching color, texture and pattern of Architect's sample.
- F. Hollow Loadbearing Block: ASTM C 90 and as follows:
  1. Weight Classification: Lightweight.
- G. 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 and 3 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.

### **2.3 GROUND FACE BLOCK**

- A. Provide smooth textured concrete masonry units, ASTM C-90, in sizes indicated as manufactured by E.P. Henry Company; or approved equal.
- B. Provide units with integral liquid polymeric water repellent admixture, mixed with concrete during production of masonry units
  1. Basis of Design: "Dry-Block Integral Water Repellent System" as manufactured by GCP Applied Technologies Inc., Cambridge, MA, Tel.# 877.423.6491 / 617.876.1400; or approved equal.
  2. Units shall be capable of attaining Class E Rating under ASTM E 514-74, and no decrease in flexural strength or compressive strength of prisms when compared to "control", under ASTM E 72-74.

3. Special shapes: Provide special block types where required for corners, control joints, headers, lintels, and other special conditions, whether or not specifically indicated on the drawings as special.
4. Provide indicated number of colors, to be selected from manufacturer's available full range of colors.

## **2.4 MASONRY LINTELS**

A. General: Provide one of the following:

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

## **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. 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.
- N. Water Repellant Admixture:
1. Basis of Design: "Dry-Block Integral Water Repellant System" as manufactured by GCP Applied Technologies Inc., Cambridge, MA, Tel.# 877.423.6491 / 617.876.1400; ; or approved equal.
  2. Provide water repellant mortar admixture to be added to mortar and grout during mixing, and capable of attaining Class E Rating under ASTM E 514-74. Tested walls, containing integral water repellant admixture and with mortar containing water repellant admixture, shall exhibit no decrease in flexural strength or compressive strength of prisms when compared to "control", under ASTM E 72-74.
  3. Provide water repellant mortar admixture for use with Architectural Concrete Masonry Units, (Ground face, Rock face, TMU, etc.) and where concrete masonry units used in areas with high exposure to water, (Basements, exposed painted exterior application, etc.).

## **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.
- 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.
- D. Unit Type Masonry Inserts in Concrete: Furnish cast iron or malleable iron inserts of type and size indicated.
- E. Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336 inch (22 gage) sheet metal.
- F. Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A 307, Grade A, hot-dip galvanized to comply with ASTM C 153, Class C, in sizes and configurations indicated.
- G. Pencil rods at construction joints as shown: Dowels dipped in tar for 1/2 of length.
- H. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.

## 2.7 CONCEALED FLASHING MATERIALS

- A. **Type 5:** CMU Flashing System, Basis of Design "Blok-Flash", as manufactured by Mortar Net, Tel.# 800.664.6638; or approved equal.
1. Moisture penetration test method: Performance in accordance with ASTM E-514-90 (1996).
  2. Bond capacity test method: ASTM C-1072-94 Test for Flexural Bond.
    - a. Exterior Face in tension: 56.6 psi .

## **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. Compressible Insulation at Top of Walls: A high-density mineral fiber insulation rated non-combustible as tested per ASTM E136.
  - 1. Basis of Design: Provide "TopStop - Head-of Wall"; Thermafiber with 3M "Firedam" fire rated sealant, or approved equal. Refer to Section 07840 for Fire-Resistive Joint Systems.
  - 2. Insulation shall sustain temperature above 2,000°F in accordance with ASTM E119 and comply with ASTM E84 for the following:
    - a. Flame Spread: 0
    - b. Smoke Developed: 0
  - 3. Provide size and shape to suit indicated conditions.
- C. 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.
- D. 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.
- E. 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.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Do not wet concrete masonry units.
- B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

- C. Thickness: Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- D. 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.
- E. 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.
- F. 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.
- G. Pattern Bond:
  - 1. Concrete masonry units: Running bond, unless otherwise shown.
  - 2. 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 ½-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.

### **3.4 INSTALLATION OF REINFORCED CONCRETE UNIT MASONRY**

- A. Do not wet concrete masonry units (CMU).
- B. Lay CMU units with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross-webs of starting courses in mortar. Maintain head and bed joint widths shown, or if not shown, provide 3/8 inch joints.
- C. Where solid CMU units are shown, lay with full mortar head and bed joints.
- D. Walls:
  - 1. For running bond lay CMU wall units in ½-running bond with vertical joints in each course centered on units in courses above and below, unless otherwise indicated. Bond and interlock each course at corners and intersections. Use special-shaped units where shown, and as required for corners, jambs, sash, control joints, lintels, bond beams and other special conditions.
    - a. For walls intersecting and/or abutting firewalls, provide control joints with fire-rated sealant as indicated in Section 07900.

2. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimension indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
3. Where horizontal reinforced beams (bond beams) are shown, use special units or modify regular units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms.
4. Option: Where all vertical cores are not shown to be grouted, Contractor may elect to fill all vertical cores with grout. In which case, requirements for mortar bedding of cross-webs and closing of core spaces below bond beams do not apply.

E. Grouting:

1. Use "Fine Grout" per ASTM C 476 for filling spaces less than 4" in one or both horizontal directions.
2. Use "Coarse Grout" per ASTM C 476 for filling 4 inch spaces or larger in both horizontal directions.
3. Grouting Technique: At the Contractor's option, use either low-lift or high-lift grouting techniques subject to requirements which follow.

F. Low-Lift Grouting:

1. Provide minimum clear dimension of 2inch and clear area of 8 sq. in. in vertical cores to be grouted.
2. Place vertical reinforcement prior to laying of CMU. Extend above elevation of maximum pour height as required for splicing. Support in position at vertical intervals not exceeding 192 bar diameters nor 10 ft.
3. Lay CMU to maximum pour height. Do not exceed 5' height, or if bond beam occurs below 5' height stop pour at course below bond beam.
4. Pour grout using chute or container with spout. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pours 1-1/2 inch below top course of pour.
5. Bond Beams: Stop grout in vertical cells 1-1/2 inch below bond beam course. Place horizontal reinforcement in bond beams; lap at corners and intersections as shown. Place grout in bond beam course before filling vertical cores above bond beam.

G. High-Lift Grouting:

1. Do not use high-lift grouting technique for grouting of CMU unless minimum cavity dimension and area is 3 inch and 10 sq. inch, respectively.

2. Provide cleanout holes in first course at all vertical cells which are to be filled with grout.
3. Use units with one face shell removed and provide temporary supports for units above, or use header units with concrete brick supports, or cut openings in one face shell.
4. Construct masonry to full height of maximum grout pour specified, prior to placing grout.
5. Limit grout lifts to a maximum height of 5 feet and grout pour to a maximum height of 24 feet, for single wythe hollow concrete masonry walls, unless otherwise indicated.
6. Place vertical reinforcement before grouting. Place before or after laying masonry units, as required by job conditions. Tie vertical reinforcement to dowels at base of masonry where shown and thread CMU over or around reinforcement. Support vertical reinforcement at intervals not exceeding 192 bar diameters nor 10 feet.
7. Where individual bars are placed after laying masonry, place wire loops extending into cells as masonry is laid and loosen before mortar sets. After insertion of reinforcement bar, pull loops and bar to proper position and tie free ends.
8. Where reinforcement is prefabricated into cage units before placing, fabricate units with vertical reinforcement bars and lateral ties of the size and spacing indicated.
9. Place horizontal beam reinforcement as the masonry units are laid.
10. Embed lateral tie reinforcement in mortar joints where indicated. Place as masonry units are laid, at vertical spacing shown.
11. Where lateral ties are shown in contact with vertical reinforcement bars, embed additional lateral tie reinforcement in mortar joints. Place as shown, or if not shown, provide as required to prevent grout blowout or rupture of CMU face shells, but provide not less than No. 2 bars or 8-gage wire ties spaced 16 inches o.c. for members with 20 inches or less side dimensions, and 8 inches o.c. for members with side dimensions exceeding 20 inches.
12. Preparation of Grout Spaces: Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcement and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond. After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.
13. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond. Install shores and bracing, if required, before starting grouting operations.
14. Place grout by pumping into grout spaces unless alternate methods are acceptable to the Architect.

15. Limit grout pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 5 feet. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Rod or vibrate each grout lift during pouring operation.
16. Place grout in lintels or beams over openings in one continuous pour.
17. Where bond beam occurs more than one course below top of pour, fill bond beam course to within 1 inch of vertically reinforced cavities, during construction of masonry.
18. When more than one pour is required to complete a given section of masonry, extend reinforcement beyond masonry as required for splicing. Pour grout to within 1-1/2 inch of top course of first pour. After grouted masonry is cured, lay masonry units and place reinforcement for second pour section before grouting. Repeat sequence if more pours are required.

### **3.5 MORTAR BEDDING AND JOINTING**

- A. 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.
- B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8 inch joints.
- C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- D. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- E. 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.

### **3.6 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 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.
  2. Do not anchor fire walls to Structural Steel, intersecting and/or abutting 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 and other materials where shown. Steel lintels weighing more than 200 lbs. will be installed by Structural Steel Subcontractor.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Precast lintels shall be scored to simulate adjacent blockwork. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
- C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

### **3.10 FLASHING OF MASONRY WORK**

- A. General: Provide concealed flashing in masonry work at base of 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.**
- B. 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.
- C. 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.
- D. Lap all flashing a minimum of 4 inches and seal laps with mastic or as recommended by manufacturer.
- E. 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.

### **3.11 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.

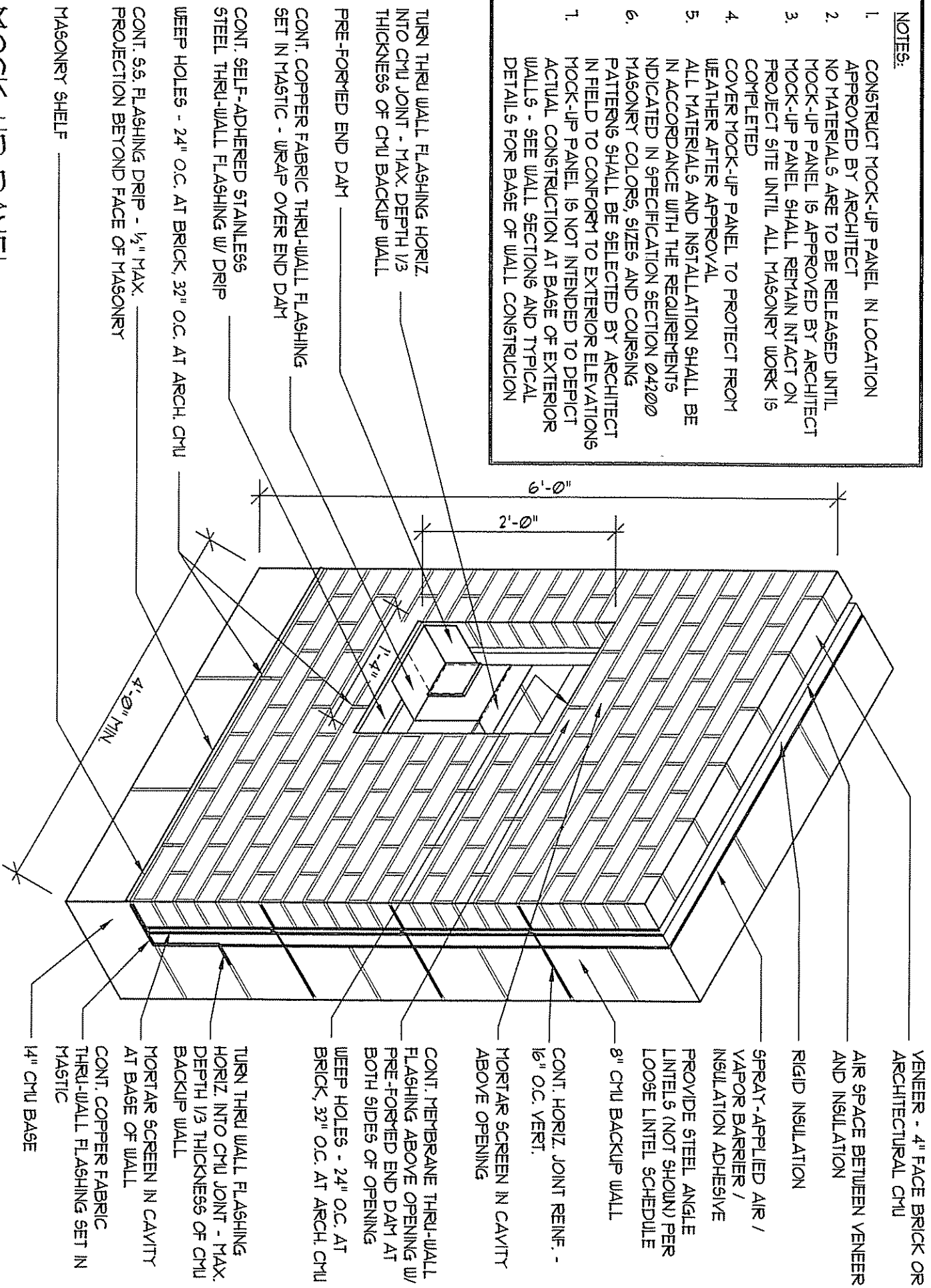
1. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

### **3.12 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 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**

- NOTES:**
1. CONSTRUCT MOCK-UP PANEL IN LOCATION APPROVED BY ARCHITECT
  2. NO MATERIALS ARE TO BE RELEASED UNTIL MOCK-UP PANEL IS APPROVED BY ARCHITECT
  3. MOCK-UP PANEL SHALL REMAIN INTACT ON PROJECT SITE UNTIL ALL MASONRY WORK IS COMPLETED
  4. COVER MOCK-UP PANEL TO PROTECT FROM WEATHER AFTER APPROVAL
  5. ALL MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS INDICATED IN SPECIFICATION SECTION 04200
  6. MASONRY COLORS, SIZES AND COURSING PATTERN SHALL BE SELECTED BY ARCHITECT IN FIELD TO CONFORM TO EXTERIOR ELEVATIONS
  1. MOCK-UP PANEL IS NOT INTENDED TO DEPICT ACTUAL CONSTRUCTION AT BASE OF EXTERIOR WALLS - SEE WALL SECTIONS AND TYPICAL DETAILS FOR BASE OF WALL CONSTRUCTION



- TURN THRU WALL FLASHING HORIZ. INTO CMU JOINT - MAX. DEPTH 1/3 THICKNESS OF CMU BACKUP WALL
- PRE-FORMED END DAM
- CONT. COPPER FABRIC THRU-WALL FLASHING SET IN MASTIC - WRAP OVER END DAM
- CONT. SELF-ADHERED STAINLESS STEEL THRU-WALL FLASHING W/ DRIP
- WEEP HOLES - 24" O.C. AT BRICK, 32" O.C. AT ARCH. CMU
- CONT. 5/8" FLASHING DRIP - 1/2" MAX. PROJECTION BEYOND FACE OF MASONRY
- MASONRY SHELF

- VENEER - 4" FACE BRICK OR ARCHITECTURAL CMU
- AIR SPACE BETWEEN VENEER AND INSULATION
- RIGID INSULATION
- SPRAY-APPLIED AIR / VAPOR BARRIER / INSULATION ADHESIVE
- PROVIDE STEEL ANGLE LINTELS (NOT SHOWN) PER LOOSE LINTEL SCHEDULE
- 8" CMU BACKUP WALL
- CONT. HORIZ. JOINT REINF. - 16" O.C. VERT.
- MORTAR SCREEN IN CAVITY ABOVE OPENING
- CONT. MEMBRANE THRU-WALL FLASHING ABOVE OPENING W/ PRE-FORMED END DAM AT BOTH SIDES OF OPENING
- WEEP HOLES - 24" O.C. AT BRICK, 32" O.C. AT ARCH. CMU
- TURN THRU WALL FLASHING HORIZ. INTO CMU JOINT - MAX. DEPTH 1/3 THICKNESS OF CMU BACKUP WALL
- MORTAR SCREEN IN CAVITY AT BASE OF WALL
- CONT. COPPER FABRIC THRU-WALL FLASHING SET IN MASTIC
- 14" CMU BASE

# MOCK-UP PANEL

SCALE: N.T.S.

## **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. Bollards.
  - 4. Cast iron downspout boots.
- C. Related Work:
  - 1. Structural Steel, including loose lintels, specified in Sections 05120 and 05400 (Part 3).
  - 2. Miscellaneous Structural Steel is specified in Section 05400 (Part 3).
  - 3. Concrete work: Section 03300.
  - 4. Masonry work: Section 04200.
  - 5. 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 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.

#### **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.

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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-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
10. 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. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

G. 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.

H. 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.

I. 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.

- J. 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.

- K. 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.
- L. 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.
- M. 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. Bollards:

1. Provide 6" diameter, 48" high minimum above ground, of galvanized steel pipe bollards, Schedule 80. Provide sleeves for bollard anchorage from galvanized steel pipe with 1/4" thick plate welded to bottom of sleeve. Fill bollards solid with concrete, and cap bollards with 1/4" minimum galvanized steel plate.
2. Provide 1/4" thick low-density yellow color polyethylene thermoplastic bumper dome top sleeve as manufactured by Ideal Shield; Innoplast; Uline; Global Industrial; or approved equal. Provide manufacturer's installation tape and appropriate custom cut for indicated height.

## 2.4 DOWNSPOUT BOOTS

A. Where indicate or required provide heavy duty cast iron downspout boots as following:

1. Basis of Design: Model # R-4929 with clean-out as manufactured by Neenah Foundry Company, Neenah, WI, Tel.# 800.558.5075, [www.neenahfoundry.com](http://www.neenahfoundry.com), or one of the following companies with a comparable product.
  - a. Barry Potter & Foundry, Birmingham, AL, Tel.# 800.524.180.
  - b. Jay R. Smith Mfg. Co.
  - c. Or approved equal.
    - 1) Size: as indicated or required.
    - 2) Length: 3 feet minimum, and to suit indicated conditions.
2. Provide manufacturer's standard anchors.

3. Provide proper outlet flexible watertight connection to vertical downspout system and in accordance with applicable plumbing codes.
4. **Paint exposed to view surfaces in accordance with requirements of Section 09900.**

## **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 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 06650 - SOLID POLYMER 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 SUMMARY

- A. Section Includes plastic window stools.

#### 1.3 SUBMITTALS

- A. Product Data: Written technical information for unit specified. Indicate product description, fabrication information and compliance with specified performance requirements.
- B. Shop Drawings:
  - 1. Submit rough-in drawings. Include the following details and all other information necessary to demonstrate compliance with contract documents:
    - a. Dimensions.
    - b. Required clearances.
    - c. Methods of assembling components.
    - d. Anchorages.
    - e. Coordination requirements with adjacent work.
- C. Samples: Submit minimum 2 inch by 2 inch samples. Indicate full range of colors and pattern variation. Approved samples will be retained as a standard for work.
- D. Certificates: Submit certification that work complies with requirements of contract documents.
- E. Manufacturer's Instructions: Submit for each product specified in this section.
  - 1. Include installation instructions and instructions for examination, preparation, and protection of adjacent work.
- F. Maintenance Data: Submit manufacturer's care and maintenance data, including care, repair and cleaning instructions and maintenance video.
  - 1. **Provide maintenance kit for indicated finishes. Include in project close-out documents.**

#### 1.4 DELIVERY, STORAGE AND HANDLING:

- A. Deliver no components to project site until areas are ready for installation. Store indoors.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

**1.5 QUALITY ASSURANCE:**

- A. Allowable Tolerances: Variation in component size: ±1/8 inch.

**1.6 WARRANTY:**

- A. Provide manufacturer's warranty against defects in materials, fabrication and installation, excluding damages caused by physical or chemical abuse or excessive heat. Warranty shall provide for replacement or repair of material and labor for a period of **ten (10) years**, beginning at Date of Substantial Completion.  
  - 1. For fabrications with installed warranty coverage, identify by affixing manufacturer's fabrication/installation source plate.

**PART 2 - PRODUCTS**

**2.1 SOLID POLYMER FABRICATIONS:**

- A. Basis of Design: Corian Surfaces as manufactured by Du Pont De Nemours & Co., Inc., Tel.# 800.426.7426; or approved equal.
- B. Subject to compliance with indicated requirements manufacturers offering products which may be incorporated in the work include the following:  
  - 1. Meganite Inc.: Manufacturer’s Rep: Richelieu Hardware, Tel.# 973.317.1400.
  - 2. LG Solid Surfaces, Tel.# 609 495-4081.
  - 3. Wilsonart: Manufacturer’s Rep: Fessenden Hall Inc., Tel.# 800.220.2233.
  - 4. Avonite Surfaces, Tel.# 800.428.6648.
  - 5. Or approved equal.
- C. Material: Cast, filled, acrylic; not coated, laminated or of composite construction, meeting ANSI Z124 1980, Type Six, and FS WW-P-541E/GEN dated August 1, 1980.

**2.2 PERFORMANCE CHARACTERISTICS:**

<u>PROPERTY</u>	<u>REQUIREMENT</u> (min/max)	<u>TEST PROCEDURE</u>
Tensile Strength	5000 psi min	ASTM D638
Tensile Modulus	1.0 x 10 <sup>6</sup> psi min	ASTM D638
Flexural Strength	7000 psi min	ASTM D790
Flexural Modulus	1.0 x 10 <sup>6</sup>	ASTM D790
Elongation	0.3% min.	ASTM D638
Strain at Break	0.8% min.	ASTM D638
Hardness	90-Rockwell "M" scale 52-Barcol Impressor min.	ASTM D758

Thermal Expansion	3.5 x 10 <sup>-6</sup> in/in/deg C max 1.95 x 10 <sup>-6</sup> in/in/deg F max	ASTM D696
Color Stability	No change, min. 100 hours	NEMA LD3-3.10
Wear and Cleanability	Passes	ANSI Z124.3
Abrasion Resistance	No loss of pattern Weight loss (1000 cycles)=0.9 g. max.	NEMA LD3-3.01 ANSI Z124.3
Boiling water Surface Resistance	No Change	NEMA LD3-3.05
High Temperature Resistance	No Change	NEMA LD3-3.06
Conductive Heat Resistance	No Change	NEMA LD3-3.08
Impact Resistance Notched Izod	0.24 ft.-lbs./in. of notch min.	ASTM D256, Method A
Gardner	9.0 ft-lbs min.	ASTM D3029
Ball drop 1/4" sheet	36" min. with 1/2 lb ball, no failure	NEMA LD3-303
1/2" sheet	140" min. with 1/2 lb ball, no failure	
3/4" sheet	200" min. with 1/2 lb ball, no failure	
Stain Resistance	Passes	ANSI Z124.3
Weatherability	No change, min. 1000 hours	ASTM D1499-84
Fungi and Bacteria	No Attack	ASTM G21, ASTM G22
Specific Gravity	1.6 min.	

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Water Absorption Weight (% max.)	<b>24 hrs.</b>	<b>Long Term</b>	ASTM D570
	0.05 (1/4") max.	0.50 (1/4") max.	
	0.10 (3/4") max.	0.90 (3/4") max.	

Flammability ASTM E84

	<b>Solid Colors</b>		
	<b>1/4"</b>	<b>1/2"</b>	<b>3/4"</b>
Flame spread	25 max	25 max	25 max
Smoke Developed	30 max	30 max	30 max
Class	1	1	1

#### Particulate Patterns

	<b>1/4"</b>	<b>1/2"</b>	<b>3/4"</b>
Flame spread	25 max	25 max	25 max
Smoke Developed	30 max	30 max	30 max
Class	1	1	1

Pittsburgh Protocol Toxicity (as used by NY state)	solids-80 grams min. particulate patterns-65 grams min.	"LC50" Test
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### 2.3 ACCESSORY PRODUCTS

- A. Joint Adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous, non-porous joints by chemical bond.
- B. Panel Adhesive: Manufacturer's standard neoprene-based panel adhesive complying with ANSI A136.1-1967, UL listed.
- C. Sealant: Manufacturer's standard mildew-resistant, FDA, UL listed silicone sealant in colors matching components.

### 2.4 FABRICATION

- A. Factory fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed Instructions and technical bulletins.

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- B. Form joints between components using manufacturer's standard joint adhesive; without conspicuous joints. Reinforce with strip of solid polymer material, 2" wide.
- C. Rout and finish component edges with clean, sharp returns. Rout cutouts, radii and contours to template. Smooth edges. Repair or reject defective and inaccurate work.
- D. Window Stools: 1/2 inch thick solid polymer material, adhesively joined with inconspicuous seams, having round edge, 1" thick minimum and with 1" minimum projection from face of wall, unless otherwise shown on the Drawings.
  - 1. Provide surfaces with a uniform finish, Matte, Gloss range of 5-20. Color to be selected from manufacturer's Color Group - 1 - 5.

## **PART 3 - EXECUTION**

### **3.1 GENERAL REQUIREMENTS**

- A. Prior to final approval of shop drawings, erect at project site one full size mock-up of each component required, for Architect's review.
- B. Should mock-up not be approved, re-fabricate and reinstall until approval is secured. Remove rejected units from project site.
- C. Approved mock-ups may remain as part of finished work.

### **3.2 INSTALLATION**

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Reinforce joints as required.
- C. Perform installation in accordance 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.

### **3.3 CLEANING**

- A. Clean shop finished surfaces, touch-up as required, and remove or refinish damaged or soiled areas, as acceptable to Architect.

### **3.4 PROTECTION**

- A. Contractor to take all precautions as recommended by the manufacturer for protection of installed window stools and other solid plastic products from damage by work of other trades.

**END OF SECTION 06650**

## **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,
    - f. Block Insulation Inserts.
  - 3. Related Work:
    - a. Section 03300 - Concrete Work,
    - b. Section 04200 - Unit Masonry,
    - c. Section 07840 - Through-Penetration Firestop Systems,
    - d. Section 09250 - Gypsum Drywall.

#### **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.
  - 3. Block Insulation Inserts:
    - a. Korfil™; by by CBIS Korfil
    - b. 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  $4.35^{\circ}\text{F} \times \text{h} \times \text{sq. ft.}/\text{Btu} \times \text{in.}$  at  $75^{\circ}\text{F}$ .
2. At all rated wallboard walls and partitions, 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.

E. Block Insulation Inserts:

1. Basis of Design: Provide molded polystyrene insulation inserts from "Standard Two Core System; Korfil"; by W.R. Grace & Co.- Const. Products; ICON; Omni Block or approved equal.
  - a. Type 1, minimum thermal resistance "R" value of 4.17 at  $75^{\circ}\text{F}$ , and typical density value of 1.0 lb./cu.ft in accordance with ASTM C578 with a density range of 1.0 to 1.3 lb/cu.ft.
  - b. Water Vapor Transmission: 0.8-2.8.
  - c. Water Absorption % Volume: Less than 2.

- d. Provide polystyrene insulation inserts to comply with the following requirements when tested in accordance with ASTM E84:
  - 1) Flame spread rating of 5 or less.

## **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. Block Insulation Inserts:
  1. Install block insulation inserts in block walls at door and window jambs and in accordance with manufacturer's instructions, in factory where possible. Replace damaged or deteriorated units.

- F. 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 07250 - SPRAYED-ON FIREPROOFING**

### **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 sprayed-on fireproofing, for use where indicated.
- B. Other Related Sections:
  - 1. Section 01400: Special Testing and Inspections
  - 2. Section 05120: Structural Steel
  - 3. Section 09900: Painting
  - 4. Section 13341: Metal Building Systems

#### **1.3 SUBMITTALS**

- A. Product data for each sprayed-on fireproofing product indicated.
- B. Test reports containing the following information:
- C. Test results from an independent testing laboratory indicating compliance of sprayed-on fireproofing products with performance requirements indicated, including asbestos content where applicable.
- D. Test results of in-place performance as required under Part 3 of this section for field quality control.
- E. Certificates from fireproofing manufacturer, for each fireproofing product required, indicating that:
- F. Primers applied to steel in shop or field are compatible with sprayed-on fireproofing and will not impair its performance under fire exposure for applications indicated, as proved by ASTM E 119 test. Include test and other data as evidence.
- G. Each fireproofing product required complies with specified product requirements and is suitable for the use indicated.

#### **1.4 QUALITY ASSURANCE**

- A. Testing Laboratory Qualifications: To qualify for acceptance, an Independent Testing Laboratory must demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying the progress of the Work.

- B. Single Source Responsibility: Obtain sprayed-on fireproofing materials from a single manufacturer for each different product required.
- C. Fire Performance Characteristics: Provide materials and construction which are identical to those tested for the following fire performance characteristics, per test method indicated, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction.
- D. Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for fire-resistance-rated assemblies in which sprayed-on fireproofing serves as direct-applied protection, tested per ASTM E 119.
- E. Surface Burning Characteristics: As indicated for each sprayed-on fireproofing product required, tested per ASTM E 84 and listed in UL "Building Materials Directory".
- F. Field-Constructed Mock-Up: Prior to installation of exposed sprayed-on fireproofing, apply each product indicated for exposed applications, in locations indicated or selected by Architect, to represent completed work for qualities of appearance, materials and application.

### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to project site in original, unopened packages with manufacturers' labels identifying products legible and intact. Include on labels names of products and manufacturers, date of manufacture and shelf life, where applicable. Also include UL labels for fire-resistance ratings applicable to project.
- B. Use materials with limited shelf life within period indicated. Remove from project site and discard any materials whose shelf life has expired.
- C. Store materials inside, under cover, above ground and in a manner to keep them dry until ready to use. Remove from project site and discard any materials that have been exposed to moisture or have otherwise deteriorated.

### **1.6 PROJECT CONDITIONS**

- A. Environmental Conditions: Do not install sprayed-on fireproofing when ambient or substrate temperatures are 40°F (4.4°C) and falling, unless temporary protection and heat can be provided to maintain temperatures of both at or above this temperature level for 24 hours before, during, and for 24 hours after application of sprayed fireproofing.
- B. Ventilation: Ventilate spray fireproofing by means of natural or, where this is inadequate, of forced air circulation during and after application until it dries thoroughly.

### **1.7 SEQUENCING**

- A. Sequence and coordinate application of sprayed-on fireproofing with other, related work specified in other sections to comply with the following requirements.
- B. Provide temporary enclosures to prevent deterioration of sprayed-on fireproofing for interior applications due to exposure to unfavorable environmental conditions.



- C. Avoid unnecessary exposure of sprayed-on fireproofing to abrasion and other damage likely to occur during construction operations subsequent to its application.
- D. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, tested, and corrections made to any defective fireproofing.

## **PART 2 - PRODUCTS**

### **2.1 SPRAYED-ON FIREPROOFING MATERIALS**

- A. Basis of Design: Provide Cementitious Fireproofing on structural steel framing and metal decking, as manufactured by one of the following:
  - 1. "Monokote MK-6"; Grace Construction Products Div., W.R. Grace & Co., NJ Rep. - Tel.# 800.354.5414, ext 5424.
  - 2. "Cafco 300", Isolatek International, Stanhope, NJ, Tel.# 973.347.1200, [www.cafco.com](http://www.cafco.com).
  - 3. "Carbonline Type 15", Carbonline Protective Coatings and Linings, St. Louis, MO, Tel.# 800.848.4645 or 314.644.1000, [www.carbonline.com](http://www.carbonline.com).
  - 4. "SWV Type 5", Southwest Fireproofing Co., Eastern Sales Office - Manasquan, NJ, Tel.# 908.528.6858.
  - 5. Or approved equal.
- B. Material Composition:
  - 1. Cementitious Fireproofing: Factory-mixed dry formulation of inorganic binders and lightweight mineral aggregates mixed with water at project site to form a slurry for pumping and for dispersal by compressed air introduced at spray nozzle.
    - a. Mineral fiber products will not be accepted for this project.
  - 2. Dry Density (ASTM E605): 15 pcf. minimum average density regardless of density indicated in referenced fire-resistive design, or greater if required to attain fire-resistive rated indicated and as determined per ASTM E 605.
  - 3. Deflection: Material shall not crack or delaminate from the surface from the surface to which it is applied when tested in accordance with ASTM E759.
  - 4. Bond Impact: Material subject to impact tests in accordance with ASTM E760; shall not crack or delaminate.
  - 5. Bond Strength (ASTM E736): Minimum average bond strength of 200 psf, minimum individual bond strength of 150 psf.
  - 6. Air Erosion (ASTM E859): Maximum allowable weight loss of material shall be 0.005 gm/sf.

7. Compressive Strength (ASTM E761): Shall not deform more than 10% when subjected to compressive forces of 1000 psf.
  8. Noncorrosive, as determined by ASTM E937.
  9. Abrasion Resistance: No more than 15 cc (cubic centimeters) shall be abraded or removed from the fireproofing substrate when tested by the methods of the City of San Francisco, Bureau of Building Inspection.
  10. Impact Penetration: Material shall not show a loss of more than 6 cc when subjected to testing methods developed by the City of San Francisco, Bureau of Building Inspection.
  11. Maximum flame spread (ASTM E84): 0.
  12. Maximum Smoke developed (ASTM E84): 0.
  13. Resistance to Mold: Add mix formulated at the time of manufacturing with mold inhibitor to comply with ASTM G21 testing procedure and shall show resistance to mold for 21 days for general use and 60 days for materials to be installed in plenums.
- C. Fireproofing material shall have been tested and reported by Underwriters Laboratories, Inc. in accordance with the procedures of UL 263 (ASTM E119).
- D. Mixing water shall be clean, fresh and suitable for domestic consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material.

### **2.3 HIGH DENSITY SPRAYED-ON FIREPROOFING - INTERIOR EXPOSED APPLICATION**

- A. Basis of Design: Provide one of the following:
- a. "Monokote Type Z-146;" Grace Construction Products Div., W. R. Grace Corp.
  - b. "Cafco 300;" Isolatek International.
  - c. "Carbonline Type 15", Carbonline Protective Coatings and Linings.
  - d. "SWV Type 5", Southwest Fireproofing Co.
  - e. Or approved equal.
- B. Coordinate manufacturer's requirements with Structural Steel and Metal Deck surface preparations.
- C. Installation for trowel grade material, "Trowel Finished" in accordance with manufacturer's instructions and recommendations.

### **2.4 AUXILIARY FIREPROOFING MATERIALS**

- A. General: Provide auxiliary fireproofing materials that are compatible with sprayed-on fireproofing products and substrates, are approved for use indicated by manufacturer of sprayed-on fireproofing, and are approved by UL or other testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance rated designs indicated.

- B. Substrate Primers: Type approved by manufacturer of sprayed-on fireproofing for substrate and for conditions of exposure indicated.
- C. Adhesive for Bonding Fireproofing: Type recommended and approved by manufacturer of sprayed-on fireproofing.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, with Installer present, to determine if they are in satisfactory condition to receive sprayed-on fireproofing. A substrate is in satisfactory condition if it complies with the following:
  - 1. Substrate complies with requirements of the section in which the substrate and related work is specified and is free of oil, grease, rolling compounds, incompatible primers, loose mill scale, dirt or other foreign substances capable of impairing bond of fireproofing with substrate under conditions of normal use or fire exposure.
  - 2. Objects which will penetrate fireproofing, including clips, hangers, support sleeves and similar items have been securely attached to substrates.
  - 3. Substrates are not obstructed by ducts, piping, equipment and other suspended construction that could interfere with application of fireproofing.
- B. For steel, sheet metal and other substrates suspected of being coated with oil, rolling compounds or other substances not readily identifiable but potentially capable of impairing bond, conduct tests recommended by fireproofing manufacturer to determine their presence and effect on adhesion of fireproofing.
- C. Do not proceed with installation of fireproofing until unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Clean substrates of substances which could impair bond of fireproofing, including oil, grease, rolling compounds, incompatible primers, and loose mill scale.
- B. Do not prime substrates unless recommended by fireproofing manufacturer, and except where compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- C. Cover other work which might be damaged by fall-out or overspray of fireproofing materials during application. Provide temporary enclosure as required to confine spraying operations, protect the environment, and to ensure adequate ambient conditions for temperature and ventilation.

### **3.3 INSTALLATION, GENERAL**

- A. General: Comply with fireproofing manufacturer's instructions for mixing materials, for

application procedures and for types of equipment used to convey and spray-on fireproofing materials; as applicable to the particular conditions of installation and as required to achieve fire-resistance ratings indicated.

- B. Coat substrates with adhesive prior to application of fireproofing where required to achieve fire-resistance rating or recommended by fireproofing manufacturer for material and application indicated.
- C. Extend fireproofing full thickness over entire area of each substrate to be protected. Unless otherwise recommended by fireproofing manufacturer, install body of fireproof covering in a single course.
- D. Apply fireproofing in thicknesses and densities not less than that required to achieve fire resistance ratings designated for each condition, unless greater thicknesses and densities are indicated.
- E. Apply fireproofing materials by sprayed-on method to maximum extent possible. Following spraying operation in each area, complete the coverage by trowel application or other placement method acceptable to manufacturer.
- F. Painted topcoat finish shall be the type recommended and approved by the manufacturer of each spray-applied fire resistive material required for the application indicated.
  - 1. Contractor shall spray apply painted finish of paint with a flame spread of less than 200, in area(s), as indicated on the drawings.

### **3.4 FIELD QUALITY CONTROL**

- A. Testing Laboratory: The Owner shall employ and pay a qualified Independent Testing Laboratory to perform field quality control testing and shall be paid for out the a project Allowance (refer to Section 01020).
- B. Extent and Testing Methodology: Arrange for testing of completed fireproofing in successive stages in areas of extent described below; do not proceed with fireproofing of next area until test results for previously completed work evidence compliance with requirements.
  - 1. Within each area, testing laboratory shall randomly select one typical structural element of each type and test fireproofing for cohesion/adhesion per ASTM E 736.
  - 2. Thickness for Structural Frame Members: Form a sample of 25 percent of structural members per floor, taking 9 measurements at a single cross section for structural frame beams or girders, 7 measurements of a single section for joists and trusses and 12 measurement of a single cross section for columns per ASTM E 605.
- C. Testing Laboratory shall report test results promptly and in writing to Contractor and Architect.
- D. Repair or replace fireproofing within areas where test results indicate fireproofing does not comply with requirements.

### **3.5 PATCHING AND REPAIR WORK**

- A. Coordinate installation of fireproofing with other work in order to minimize the need for other trades to cut or remove fireproofing. As other trades successively complete installation of their work, maintain protection of structure afforded by fireproofing by patching any areas which have been removed or damaged prior to concealment of fireproofing by other work.
  - 1. All patching and repairing of sprayed-on applied fireproofing, including damage which occurs during work by other trades, shall be performed with same materials under this section, without any additional cost to the Owner.

### **3.6 CLEANING AND PROTECTION**

- A. Cleaning: Immediately upon completion of spraying operations in each containable area of project, remove over-spray and fall-out of materials from surfaces of other work and clean exposed surfaces to remove evidence of soiling.
- B. Cure exposed cementitious fireproofing materials in compliance with fireproofing manufacturers recommendations to prevent premature drying.
- C. Protect fireproofing according to advice of fireproofing manufacturer and Installer from damage resulting from construction operations or other causes so that fireproofing will be without damage or deterioration at time of Substantial Completion.
- D. Repair or replace work which has not been successfully protected.

**END OF SECTION 07250**

## **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 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.
  - 6. Pipe-Penetration Flashing.
- B. Related Sections:
  - 1. Section 07800 - Roof Specialties and Accessories.
  - 2. Section 07900 - Joint Sealer Assemblies.
  - 3. Section 13341 - Metal Building Systems.

#### **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. Aluminum Association, Design System for Aluminum Finishes (AA).
- E. American Architectural Manufacturers Association (AMMA), standards as referenced herein.

- F. 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. Covering on minor flat, and pitched surfaces.
    - b. Metal edge, and fascia.
    - c. Base flashing and counterflashing.
    - d. Metal edge, metal drip.
    - e. Flashing for roof penetrations.
    - f. Gutters, rain water conductors (downspouts), anchors and accessories.
    - g. Drain insert strainer.
    - h. All other sheet metal work requiring fabrication.
    - i. Details of all joints for above.
    - j. 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 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, gutters, downspout system 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, and Fascia:
    - a. Hickman: W.P. Hickman Co., Tel.# 828.676.1700, [www.wph.com](http://www.wph.com).
    - b. Imetco, an ESOP Company.
    - c. Metal-Era, Inc., Tel.# 800.558.2162, [www.metalera.com](http://www.metalera.com).
    - d. Southern Aluminum Finishing Co., Tel.# 800.241.7429, [www.saf.com](http://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](http://www.wph.com).
    - b. Metal-Era, Inc., Tel.# 800.558.2162, [www.metalera.com](http://www.metalera.com).
    - c. Southern Aluminum Finishing Co., Tel.# 800.241.7429, [www.saf.com](http://www.saf.com).
    - d. Berger Building Products, Tel. 800.523.8852, [www.bergerbuildingproducts.com](http://www.bergerbuildingproducts.com)
    - e. or approved equal.



3. Aluminum Reglets:
  - a. Fry Reglet Corporation, Tel.# 800.237.9773, [www.fryreglet.com](http://www.fryreglet.com).
  - b. Hickman: W.P. Hickman Co., Tel.# 828.676.1700, [www.wph.com](http://www.wph.com).
  - c. Keystone Flashing Company, Tel.# 800.526.8348, [www.keystoneflashing.com](http://www.keystoneflashing.com)
  - d. CertainTeed, Saint-Gobain, Tel.# 800-233-8990, [www.certainteed.com](http://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.
- B. Type "H"; Coil-Coated Galvanized Steel Sheet: Zinc-coated, commercial-quality steel sheet conforming to ASTM A 755, G 90 coating designation, coil coated with high-performance fluoropolymer coating as specified in "Coil-Coated Galvanized Steel Sheet Finish" Article; not less than 0.0336 inch thick, unless otherwise indicated.

## 2.3 FASCIA, & ROOF EDGE

- A. 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 ROOF METAL EDGE & METAL DRIP

- A. Provide contractor fabricated exposed components fabricated from the following metal:
  1. Formed-aluminum sheet in thickness indicated. Refer to Architectural drawings for thickness / height requirement(s).
  2. **Shop drawing must be submitted to the Architect before payment is authorized by the Architect for the work.**
- B. Drip Edges: Fabricate in lengths not exceeding [10 feet (3 m)] with 2-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.5-mm) drip at lower edge.

## 2.5 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. Downspout hanger; SMACNA FIG 1-35 H, and as indicated
  5. 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.

## **2.6 REGLETS**

- A. General: Provide reglets of type, material, and profile indicated, compatible with flashing. Form to securely interlock with counterflashing.
1. Type - 5: Roof Top Equipment Curb: Provide "MA" springlok Reglet by Fry Reglet Corp.; or approved equal.
    - a. 0.040" thick aluminum, with 1-1/2" top flange, color as selected by Architect.
    - b. Provide 3" minimum lap joints.
  2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of the counterflashing's lower edge.

## **2.7 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. 24 ga. galvanized steel, painted.
  3. Provide inside and outside corners including special angle where required.

## **2.8 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.

## **2.9 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.

### 2.10 ALUMINUM FINISHES

- 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.
- C. Coil-Coated Galvanized Steel Sheet Finish

1. High-Performance Organic Coating Finish: Apply the following system by coil-coating process on galvanized steel sheet as recommended by coating manufacturers and applicator.
  - a. 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.
    - 1) Color(s): As selected by the Architect from manufacturer's available full range of colors including custom colors.
    - 2) Coil-Coated Steel Sheet Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a) Atas Aluminum Corporation.
      - b) Petersen Aluminum Corporation.
      - c) or approved equal.

## **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 1/2-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 1/2-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 3/4-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. Counterflashing: Except where indicated or specified otherwise, insert counterflashing receiver in horizontal saw cut joints locations as indicated. Snap counterflashing in receiver and extend down vertical surfaces over upturned vertical leg or base flashings not less than 4 inches. Exposed edges of counterflashing shall be folded 1/2-inch. End laps in counterflashings shall be overlapped 6", and shall be made weathertight with sealant.
  1. Lengths of metal counterflashings shall not exceed 10 feet. The flashings shall be formed to the required shapes before installation. Corners shall be factory-formed with joints not less than 24 inches from the angle.
  2. Flashing receivers shall be secured in the horizontal joint with lead wedges spaced not to exceed 12 inches apart; on short runs, wedges shall be placed closer together.
  3. Counterflashing receiver joints shall be filled with caulking compound. Caulking is covered in Section 07900 - Joint Sealer Assemblies.
- J. Metal Flashing Installation
  1. General: Install metal flashings and other sheet metal to comply with requirements in Section 07600 "Sheet Metal Flashing and Trim."
    - a. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
  2. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
  3. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- K. 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**

**FVHD-5195**

**2:07600-11**



## **SECTION 07840 - THROUGH-PENETRATION FIRESTOP SYSTEMS**

### **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 through-penetration firestop systems for penetrations through the following fire-resistance-rated assemblies, including both empty openings and openings containing penetrating items:
  - 1. Walls and partitions.
  - 2. Smoke barriers.
  - 3. Construction enclosing compartmentalized areas.
- B. Related Sections include the following:
  - 1. Division 7 Section "Building Insulation" for safing insulation and accessories.
  - 2. Division 7 Section "Sprayed Fire-Resistive Materials."
  - 3. Division 15 Sections specifying duct and piping penetrations and firestop systems to be performed by the Plumbing and HVAC work (Sub)Contractors.
  - 4. Division 16 Sections specifying cable and conduit penetrations and firestop systems to be performed by the Electrical (Sub)Contractor.

#### **1.3 PERFORMANCE REQUIREMENTS**

- A. General: For the following constructions, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.
  - 1. Fire-resistance-rated load-bearing walls, including partitions, with fire-protection-rated openings.
  - 2. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.
- B. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
- C. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems

protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

1. Penetrations located outside wall cavities.
  2. Penetrations located in construction containing fire-protection-rated openings.
  3. Penetrating items larger than 4-inch-diameter nominal pipe or 16 sq. in. in overall cross-sectional area.
- D. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
1. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
  2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- E. For through-penetration firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E 84.

#### **1.4 SUBMITTALS**

- A. Product Data: For each type of through-penetration firestop system product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating item. Include firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.
1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
  2. Where Project conditions require modification of qualified testing and inspecting agency's illustration to suit a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architect and Owner, and other information specified.
- D. Product Certificates: Signed by manufacturers of through-penetration firestop system products certifying that products furnished comply with requirements.

- E. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

## **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed through-penetration firestop systems 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.
- B. Installer Qualifications: An experienced installer who is qualified by having the necessary experience, staff, and training to install manufacturer's products per specified requirements. A manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to an installer engaged by Contractor does not in itself confer qualification on buyer.
- C. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in "Performance Requirements" Article:
  - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
  - 2. Through-penetration firestop systems are identical to those tested per ASTM E 814. Provide rated systems complying with the following requirements:
    - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
    - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
      - 1) UL in "Fire Resistance Directory."
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi component materials.
- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

## **1.7 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

## **1.8 COORDINATION**

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. Notify Contractor's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until Contractor's inspecting agency and building inspector, if required by authorities having jurisdiction, have examined each installation.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCTS / MANUFACTURERS**

- A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application in the Through-Penetration Firestop System Schedule at the end of Part 3 and as shown on drawings and as produced by one of the following manufacturers:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Hilti Construction Chemicals, Inc.
  - 2. Isolatek International.
  - 3. Nelson Firestop Products.
  - 4. 3M Fire Protection Products.
  - 5. Or approved equal.

### **2.2 FIRESTOPPING, GENERAL**

- A. Compatibility: Provide through-penetration firestop systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

- B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
1. Permanent forming/damming/backing materials, including the following:
    - a. Slag-/rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
  2. Temporary forming materials.
  3. Substrate primers.
  4. Collars.
  5. Steel sleeves.

### **2.3 FILL MATERIALS**

- A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by reference to the types of materials described in this Article. Fill materials are those referred to in directories of the referenced testing and inspecting agencies as fill, void, or cavity materials.
- B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.
- E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable, heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
- I. Silicone Foams: Multi component, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

- J. Silicone Sealants: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
  - 1. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

## **2.4 MIXING**

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with written recommendations of firestop system manufacturer and the following requirements:
  - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
  - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

### **3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION**

- A. General: Install through-penetration firestop systems to comply with "Performance

Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for firestop systems by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
  - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### **3.4 FIELD QUALITY CONTROL**

- A. Inspecting Agency: The Owner will engage a qualified independent inspecting agency to inspect through-penetration firestop systems and to prepare test reports to be paid out of the Allowance for special inspections.
  - 1. Inspecting agency will state in each report whether inspected through-penetration firestop systems comply with or deviate from requirements.
- B. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued.
- C. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

### **3.5 IDENTIFICATION**

- A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
  - 1. The words: "Warning-Through-Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.

4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

### **3.6 CLEANING AND PROTECTION**

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.

### **3.7 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE**

- A. Where UL-classified systems are indicated, they refer to the alpha-alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.
  1. Firestop Systems with No Penetrating Items: Comply with the following:
    - a. Latex sealant.
    - b. Silicone sealant.
    - c. Intumescent putty.
    - d. Mortar.

**END OF SECTION 07840**



## 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 metal panels.
  - 4. Joints between different materials listed above.
  - 5. Perimeter joints between materials listed above and frames of doors, and windows, as applicable.
  - 6. 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. 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 and concrete walls and partitions.
    - a. Perimeter joints between interior wall surfaces and frames of doors and windows.
    - b. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - c. 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. Control and expansion joints in tile flooring.
    - c. 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:

- (1) 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 Warrantee 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 Sidewalks: Provide Isomeric polymer foam, W.R. Meadows Sealtight Ceramar; or approved equal.
    - a. Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
    - b. Closed-cell isomeric foam, flexible.
    - c. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
      - 1) "Expansion Joint", as manufactured by Construction Foam Products, Tel.# 919.380.6640, [www.cfoamproducts.com](http://www.cfoamproducts.com).
      - 2) Or approved equal.
  2. 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.
  3. 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](http://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 Urexpam"; 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 3:** For all interior joints, provide a one-part, non-sag, moisture-curing polyurethane rubber sealant, complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, A, O and as recommended by manufacturer for general use as an interior exposed building construction conditions sealant including floor tiles in Toilets - Section 09300.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Dynatrol I-XL"; Pecora Corporation.
    - b. "Dymonic or Dymonic FC for cold weather"; Tremco, an RPM Co.
    - c. "Chem-Calk 900 /915/945"; Bostik Inc.
    - d. "Sikaflex 1a or Sikaflex 15LM"; Sika Corporation.
    - e. Or approved equal.
- D. **Sealant Type 4:** For all joints at plumbing fixtures, provide one-part, neutral-curing, silicone rubber sanitary sealant, complying with ASTM C920; and containing fungicide for mildew resistance recommended by manufacturer for use at joints for plumbing fixtures; sinks countertops, appliances, etc.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "898 Silicone"; Pecora Corporation.
    - b. "Tremsil 200"; Tremco, an RPM Co.
    - c. "786 Mildew Resistant"; Dow Corning.
    - d. "Sikasil N-Plus"; Sika Corporation.
    - e. Or approved equal.
- E. **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**

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**2:07900-9**

## **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 door frames and borrow lites are indicated and scheduled on the drawings.
- B. Related Sections:
  - 1. Section 04200 - Masonry Work.
  - 2. Section 08211 - Wood Doors.
  - 3. Section 08700 - Finish Hardware.
  - 4. Section 08800 - Glass & Glazing.
  - 5. Section 09250 - Gypsum Drywall.
  - 6. Section 09900 - Painting.

#### **1.3 QUALITY ASSURANCE**

- A. Provide doors and 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, door swing, 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 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, borrowed lights 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.
  2. Fabricate frames with mitered and welded corners.
- 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) 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.

## **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. 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 09250 - Gypsum Drywall
  - 8. Section 09900 - Field Painting of metal lites

#### **1.2 SUMMARY**

- A. Extent and location of 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.
- 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, 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](http://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](http://www.eggersindustries.com).
    - b. VT Industries, Architectural Wood Doors, Tel.# 800.827.1615, [www.vtindustries.com/doors](http://www.vtindustries.com/doors).
    - c. Graham Wood Doors, Tel.# 641.423.2444, [www.grahamdoors.com](http://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.
  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) 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".

### 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. Pairs of doors will be undersized 3/16 inch to permit no more than 1/8 inch gap between door leaves. Beveling same as single doors. Door edges beveled 1/8 inch in 2 inch thickness of door.
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. Metal Astragals: Metal astragals **will not** be accepted, unless otherwise indicated in Section 08700.

- E. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of doors required.
- F. 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. Pairs of doors are to have matching grain pattern and color.
  - 4. End match panels or transoms to have a continuous grain pattern and color of door in total door assembly.
  - 5. Comply with recommendations of WDMA for factory finishing of doors, including final sanding, immediately before application of finishing materials.
  - 6. 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. Install surface applied hardware on 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 08330 - INSULATED ROLLING SERVICE DOOR

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes: Electric operated overhead insulated rolling doors.
- B. Related Sections:
  - 1. Section 05500 - Metal Fabrications. Door opening jamb and head members.
  - 2. Section 06100 - Carpentry. Door opening jamb and head members.
  - 3. Section 08305 - Access Doors and Panels. Access doors.
  - 4. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, and installation of control station and wiring.
- C. Products that may be supplied, but are not installed under this Section:
  - 1. Control Station.

#### 1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Air Infiltration to comply with:
    - a. **ASHRAE**<sup>®</sup> (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) Standard 90.1-2007, 2010 & 2013 requirements of less than .3 CFM/FT<sup>2</sup>.
    - b. **IECC**<sup>®</sup> (International Energy Conservation Code) 2012 requirements of less than 1.0 CFM/FT<sup>2</sup>.
  - 2. Wind Loading:
    - a. Supply door(s) to withstand up to 20 psf design wind load.
  - 3. Cycle Life:
    - a. Design doors of standard construction for normal use of up to 20 cycles per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door.
  - 4. Insulated Door Slat Material Requirements:
    - a. Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84.
    - b. Sound Transmission Class (STC) rating up to 30 for the curtain and up to 22 for the entire assembly. All configurations are evaluated per ASTM E90 and based on testing a complete, operable assembly.
    - c. Minimum R-value of 8.0 (U-value of 0.125) as calculated using the ASHRAE Handbook of Fundamentals.
    - d. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero.
  - 5. Safety:
    - a. Chain operated doors shall be designed so that the door immediately stops upward or downward travel and is maintained in a stationary position when the hand chain is released by user.

### 1.3 SUBMITTALS

- A. 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 manufacturer ISO 9001:2015 registration.
    - b. Provide manufacturer and installer qualifications - see below.
    - c. Provide manufacturer's installation instruction.
    - d. Manufacturer must provide independent testing lab results proving .3 CFM/FT2 or less air infiltration.
  - 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 9001:2015 registered and a recommended minimum of five years' experience in producing doors of the type specified.
  - 2. Installer Qualifications: Manufacturer's approval.

### 1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01600 for Product Storage and Handling 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 - PRODUCT

### 2.1 MANUFACTURER

- A. Acceptable Manufacturers:
  - 1. Cornell-Cookson.

**FVHD-5195**

**2:08330-2**



2. Clopay Building Products.
3. Atlas Door Corp.
4. Overhead Door Corp.
5. Raynor Manufacturing Co.
6. Or approved equal.

## 2.2 PRODUCT INFORMATION

- A. Basis of Design: Model ESD30, as manufactured by Cornell-Cookson; Mountain Top, PA; Tel.# 800.233.8366; or approved equal.

## 2.3 MATERIALS

- A. Curtain: Air infiltration rate of less than .3 CFM/FT<sup>2</sup>, as tested per ASTM E283 validated by an independent testing agency. Test report required.
  1. Fabrication:
    - a. Slat Material: No. 6F, (Listed Exterior/Interior):
      - 1) Galvanized Steel/Galvanized Steel: Manufacturer recommended gauge based on performance requirements. Minimum 22/22 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating.
    - b. Insulation: 7/8 inch (22 mm) foamed-in-place, closed cell urethane.
    - c. Total Slat Thickness: 15/16 inch (24 mm).
    - d. Flame Spread Index = 0 and Smoke Developed Index = 10 as tested per ASTM E84.
    - e. R-Value: 8.0.
    - f. STC Rating: Sound Transmission Class (STC) rating up to 30 for the curtain and up to 22 for the entire assembly. All configurations are evaluated per ASTM E90 and based on testing a complete, operable assembly.
  2. Exterior Slat Finish:
    - a. SpectraShield® Coating System (Color Selected by Architect):
      - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat.
      - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.
  3. Interior Slat Finish:
    - a. SpectraShield® Coating System (Color as selected by Architect):
      - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat.
      - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

- B. Endlocks: Fabricate interlocking sections with high strength nylon endlocks on alternate slats each secured with two 1/4" (6.35 mm) rivets. Provide windlocks, as required to meet specified wind load.
1. Nylon: Required up to 21'-5" width (DBG - Distance Between Guides).
- C. Bottom Bar
1. Configuration:
    - a. Insulated Bottom Bar: Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4" tall x 1-1/16" thickness.
  2. Finish:
    - a. Exterior: Match slats.
    - b. Interior: Powder coat to match slats.
  3. Air Infiltration Certification Label: Must be affixed to bottom bar.
- D. Guides:
1. Fabrication:
    - a. Thermal break required. Minimum 3/16 inch (4.76 mm) structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar. Top 16 1/2" (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
  2. Finish:
    - a. SpectraShield® Coating System (Color Selected by Architect): Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.
- E. 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.
- F. Brackets: Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
1. Finish:

- a. SpectraShield® Coating System (Color as selected by Architect): Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better
- G. Hood: Minimum 24 gauge galvanized 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.
- 1. Finish:
    - a. SpectraShield® Coating System (Color as selected by Architect):
      - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat.
      - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.
- H. Weatherstripping:
- 1. Bottom Bar:
    - a. Motor Operated Doors: Sensing/weather edge with neoprene astragal extending full width of door bottom bar.
  - 2. Guides: Replaceable vinyl strip on guides sealing against fascia side of curtain.
  - 3. Lintel Seal: Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.

## 2.4 OPERATION

- A. Motor, Standard Use – Model MG (Industrial Duty Gear Head) Operator: The operator must not extend above or below the door coil when mounted front-of-coil. Rated for a maximum of 20 cycles per hour (not to be used for consecutive hours) UL listed (to comply with UL requirements in the United States), Totally Enclosed Non-Ventilated gear head operator(s) rated 1/2 hp as recommended by door manufacture for size and type of door, 120 Volts, 1 Phase. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist and control station(s). Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position. Operator shall be equipped with an emergency manual chain hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with #50 roller chain. Operator shall be capable of driving the door at a speed of 8 to 9 inches per second (20 to 23 cm/sec). Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The electrical contractor shall mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.
- B. Control Station:

1. 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. 2-wire, E.L.R. electric sensing/weather edge seal extending full width of door bottom bar.
2. Sensing/Weather Edge: Automatic reversing control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar.
  - a. Electric sensing edge device. Provide a wireless sensing edge connection to motor operator eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operator.

## 2.5 ACCESSORIES

- A. Locking: None.
- B. Operator Cover: Minimum 24 gauge galvanized steel sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood.

## 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. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. 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 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

### **3.5 DEMONSTRATION**

- A. Demonstrate proper operation to Owner's Representatives.
- B. Instruct Owner's Representatives in maintenance procedures.

**END OF SECTION 08330**

## **SECTION 08410 - FRP DOOR AND ALUMINUM FRAMING SYSTEM**

### **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 provide and install aluminum frames, doors, hardware, glazing, etc. In general, the work under this section includes the following:
  - 1. The furnishing and installation of frames, doors, hardware, glazing and caulking, as required, for a complete installation including all necessary cleaning and adjustments.
- B. The following type of doors, frames and accessories are required:
  - 1. Fiberglass Reinforced Polyester (FRP) Doors.
  - 2. Heavy Wall Tube Aluminum-Framed Systems.
  - 3. Glazing.
  - 4. Hardware.
  - 5. Sealants.
- C. Related Sections
  - 1. Section 01030 - Alternate Bids.
  - 2. Section 04200 - Unit Masonry.
  - 3. Section 07900 - Joint Sealer Assemblies.
  - 4. Section 08700 - Finish Hardware.
  - 5. Section 08800 - Glass and Glazing.
  - 6. Section 13341 - Metal Building System.

#### **1.3 REFERENCES**

- A. Fiberglass Reinforced Polyester (FRP) Flush Doors and Monumental Stile and Rail Door
  - 1. AAMA 1503-98 - Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  - 2. ANSI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.
  - 3. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
  - 4. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.
  - 5. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 6. ASTM D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
  - 7. ASTM D 543 - Evaluating the Resistance of Plastics to Chemical Reagents.
  - 8. ASTM D 570 - Water Absorption of Plastics.
  - 9. ASTM D 638 - Tensile Properties of Plastics.

10. ASTM D 790 - Flexural Properties of Non-reinforced and Reinforced Plastics and Electrical Insulating Materials.
11. ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
12. ASTM D 1621 - Compressive Properties of Rigid Cellular Plastics.
13. ASTM D 1623 - Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
14. ASTM D 2126 - Response of Rigid Cellular Plastics to Thermal and Humid Aging.
15. ASTM D 2583 - Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
16. ASTM D 5420 - Impact Resistance of Flat Rigid Plastic Specimens by Means of a Falling Weight.
17. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.
18. ASTM E 84 - Surface Burning Characteristics of Building Materials.
19. ASTM E 90 - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
20. ASTM E 283 - Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
21. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
22. ASTM E 331 - Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
23. ASTM F 476 - Security of Swinging Door Assemblies.
24. ASTM F 1642-04 - Standard Test Method for Glazing Systems Subject to Air blast loading.
25. NWWDA T.M. 7-90 - Cycle Slam Test Method
26. SFBC PA 201 - Impact Test Procedures.
27. SFBC PA 203 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
28. SFBC 3603.2 (b) (5) - Forced Entry Resistance Test.

#### **1.4 REFERENCES**

- A. Heavy Wall Tube Aluminum-Framed Storefronts and Door Perimeter Framing
  1. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  2. ASTM D 1667 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Closed-Cell Form).
  3. ASTM D 2000 - Classification System for Rubber Products in Automotive Applications.
  4. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.

## 1.5 PERFORMANCE REQUIREMENTS

### A. Fiberglass Reinforced Polyester (FRP) Flush Doors

1. 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.
2. 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.
3. 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.
4. Indoor air quality testing per ASTM D 6670-01: GREENGUARD Environmental Institute Certified including GREENGUARD for Children and Schools Certification.
5. Swinging Door Cycle Test, Doors and Frames, ANSI A250.4: Minimum of 25,000,000 cycles.
6. Cycle Slam Test Method, NWWDA T.M. 7-90: Minimum 5,000,000 Cycles.
7. Swinging Security Door Assembly, Doors and Frames, ASTM F 476: Grade 40.
8. Salt Spray, Exterior Doors and Frames, ASTM B 117: Minimum of 500 hours.
9. Sound Transmission, Exterior Doors, STC, ASTM E 90: Minimum of 25.
10. 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.
11. Surface Burning Characteristics, FRP Doors and Panels, ASTM E 84:
  - a. Flame Spread: Maximum of 200. (Class C).
  - b. Smoke Developed: Maximum of 450. (Class C).
12. Surface Burning Characteristics, Class A Option On Interior Faces of FRP Exterior Panels and Both Faces of FRP Interior Panels, ASTM E 84:
  - a. Flame Spread: Maximum of 25.
  - b. Smoke Developed: Maximum of 450.
13. Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 256: 15.0 foot-lbs per inch of notch.
14. Tensile Strength, FRP Doors and Panels, Nominal Value, ASTM D 638: 14,000 psi.
15. Flexural Strength, FRP Doors and Panels, Nominal Value, ASTM D 790: 21,000 psi.
16. Water Absorption, FRP Doors and Panels, Nominal Value, ASTM D 570: 0.20 percent after 24 hours.
17. Indentation Hardness, FRP Doors and Panels, Nominal Value, ASTM D 2583: 55.
18. Gardner Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 5420: 120 in-lb.
19. 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.



20. 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.
  21. Chemical Resistance, ASTM D 543. Excellent rating.
    - a. Acetic acid, Concentrated.
    - b. Ammonium Hydroxide, Concentrated.
    - c. Citric Acid, 10%.
    - d. Formaldehyde.
    - e. Hydrochloric Acid, 10%
    - f. Sodium hypochlorite, 4 to 6 percent solution.
  22. Compressive Strength, Foam Core, Nominal Value, ASTM D 1621: 79.9 psi.
  23. Compressive Modulus, Foam Core, Nominal Value, ASTM D 1621: 370 psi.
  24. Tensile Adhesion, Foam Core, Nominal Value, ASTM D 1623: 45.3 psi.
  25. Thermal and Humid Aging, Foam Core, Nominal Value, 158°F and 100 % Humidity for 14 Days, ASTM D 2126: Minus 5.14 percent volume change.
  26. Compliance with the International Building Code® (IBC), latest NJ Edition.
- B. Heavy Wall Tube Aluminum-Framed Storefront and Door Perimeter Framing.
1. General: Provide framing systems that comply with specified design and performance requirements, based on testing of current products.
  2. Thermal Movement: Design framing systems to provide for expansion and contraction of component materials.
  3. Indoor air quality testing per ASTM D 6670-01: GREENGUARD Environmental Institute Certified including GREENGUARD for Children and Schools Certification.

## 1.6 SUBMITTALS

- A. Comply with AIA A201 and Section 00800 - Submittal Procedures.
- 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 Aluminum Frames, 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, and include Catalog cuts for all Finish Hardware.
- D. Samples:
  1. FRP Door: Submit corner samples of manufacturer's door showing face sheets, core, internal framing, finish, glazing, hardware, 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. Framing: Submit manufacturer's corner samples of Heavy Wall Tube Aluminum-Framed Storefronts and Door Perimeter Framing showing, glazing and finish.

3. Stile and Rail Door: Submit manufacturer's sample of doors showing, rails, framing, hardware, glazing and finish.
  4. Color: Submit manufacturer's color chip samples of Standard of Classic FRP Door and Panel Skins and either Standard or Optional Anodized Finish at the Door Stiles and Rails, Door Perimeter and Storefront Framing.
- 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, including maintenance and operating instructions for hardware.
  - H. Warranty: Submit manufacturer's standard warranty.

### **1.7 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 (FRP) Doors and Aluminum Frames for a recommended ten (10) years, and shall have completed projects similar to this building in type and size.
  1. Door and frame components from same 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 particular component. If the door, frame 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.

### **1.8 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 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.

## 1.9 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 or frames that fail in materials or workmanship, within the time period of acceptance, as indicated below.
  - 1. Failure of materials or workmanship includes excessive deflection, faulty operation of entrances, deterioration of finish, or construction, in excess of normal weathering and defects in hardware, weather-stripping and other components of the work.
- B. Warranty Period: **Ten (10) years** from approved date of Substantial Completion, as determined by the Architect.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. **FRP Doors:** Basis-of-Design: Special-Lite Inc., Tel.# 800.821.6531, [www.special-lite.com](http://www.special-lite.com); or approved equal.
  - 1. Subject to compliance with requirements, provide either the named product or product by one of the following manufacturers:
    - a. Kawneer Co.
    - b. FRP Architectural Doors Inc.
    - d. 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.
  - 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 or butted mortise and tenon joints.
  - 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. With the exception of 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. Refer to Section 08800 - Glass and Glazing for type.

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.
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: Standard and or Classic as approved by the Architect.

### 2.3 ALUMINUM PERIMETER DOOR AND STOREFRONT FRAMING SYSTEMS

- A. Model: SL-260 Heavy Wall Tube Aluminum - Framing Storefront System.
- B. Framing Size:
  1. Specify frame size 2 inches by 6 inches as per Section 2.3, subsection A.
  2. Material: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T5 alloy recovered from industrial processes.
  3. Jambs, Mullions, Sills, Horizontal Intermediates, and Headers: 0.125-inch wall thickness.
  4. Lock Jambs, Hinge Jambs, and Door Headers: 0.125-inch minimum wall thickness.
- C. Applied Door Stops: 0.625 inch with screws and weather stripping. Door stop will incorporate pressure gasketing for weathering seal. Counterpunch fastener holes in door stop to preserve full metal thickness under fastener head.
- D. Frame Members: Box type with 4 enclosed sides. Open back framing is not acceptable.
- E. Caulking: Caulk joints before assembling frame members.
- F. Joints:
  1. Secure joints with fasteners.
  2. Provide hairline butt joint appearance.
- G. Field Fabrication: Field fabrication of framing using stick materials is not acceptable.
- H. Applied Stops: For side, transom, and borrowed lites and panels, with fasteners exposed on interior or un-secure portion only. Applied stops will incorporate pressure gasketing for weathering seal. Reinforce with solid bar stock fill for all frame hardware attachments.
- I. Hardware:
  1. Pre-machine and reinforce frame members for hardware in accordance with manufacturer's standards and hardware schedule.
  2. Factory Install hardware.
- J. Anchors:
  1. Anchors appropriate for wall conditions to anchor framing to wall materials.
  2. Door Jamb and Header Mounting Holes: Maximum of 24-inch centers.
  3. Secure head and sill members of transom, side lites, and similar conditions.

- K. Side Lites:
  1. Factory pre-assembled side lites to greatest extent possible.
  2. Mark frame assemblies according to location.
- L. Fasteners:
  1. Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
  2. Compatibility: Compatible with items to be fastened.
  3. Exposed Fasteners: Screws with finish matching items to be fastened.
- M. Glazing Gaskets: Gaskets installed in captive assembly of glazing stops.
  1. EPDM: ASTM D 2000.
  2. Closed-Cell Foam: ASTM D 1667
- N. Applied Door Stops: 0.625 inch with screws and weather stripping. Door stop will incorporate pressure gasketing for weathering seal. Counterpunch fastener holes in door stop to preserve full metal thickness under fastener head.
- O. Frame Members: Box type with 4 enclosed sides. Open back framing is not acceptable.
- P. Caulking: Caulk joints before assembling frame members.
- Q. Field Fabrication: Field fabrication of framing using stick materials is not acceptable.

#### **2.4 MATERIALS AND ACCESSORIES - Fiberglass Reinforced Polyester (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. All materials shall be of the same manufacturer. No splitting of Door, Frame or components will be permitted.
- C. 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, 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.
- D. 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.
- E. Expansion Anchor Devices: Lead shield or toothed steel, drill-in, expansion bolt anchors.
- F. Bituminous Coating: Cold applied asphalt mastic complying with SPC-PS 12, compounded for 30-mil thickness per coat.
- G. 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.
- H. 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.

## **2.5 FABRICATION**

- A. Sizes and Profiles: The required sizes for door and frame 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.

## **2.6 HARDWARE**

- A. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
- B. Hardware Schedule: As indicated on the drawings and as specified in Section 08700.

## **2.7 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 Lites:
  - 1. Size: As indicated on drawings.
  - 2. Factory glazed with screw-applied aluminum stops anodized to match perimeter door stile and rails.

## **2.8 ALUMINUM FINISH**

- A. Anodized Finish: Clear 215 R1, AA-M10C12C22A41, Class I, 0.7 mils thick.

## **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 (FRP))**

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- E. 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 INSTALLATION - FRAMES**

- A. Install framing systems in accordance with manufacturer's instructions.
- B. Install framing systems plumb, level, square, true to line, and weathertight, without warp or rack.
- C. Anchor framing securely in place.
- D. Tolerances: Install framing systems in accordance with the following tolerances:
  - 1. Variation from Plane: Do not exceed 1/8 inch in 12 feet of length or 1/4 inch in any total length.
  - 2. Offset from Alignment: Maximum offset from true alignment between 2 identical members abutting end to end in line shall not exceed 1/16 inch.

3. Diagonal Measurements: Maximum difference in diagonal measurements shall not exceed 1/8 inch.
  4. Offset at Corners: Maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch.
- E. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
  - F. Set sills, door thresholds, and other members in bed of sealant or with joint fillers or gaskets to provide weathertight construction. Comply with Section 07900.
  - G. Install sill flashing to make frame watertight at sill.
  - H. Glass: Install glass indicated to be glazed into framing, and not preglazed, as specified in Section 08800.
  - I. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
  - J. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

### **3.5 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

### **3.6 ADJUSTING**

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

### **3.7 CLEANING**

- A. Clean doors/framing systems promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish or glazing.

### **3.8 PROTECTION**

- A. Protect installed doors and framing systems to ensure that, except for normal weathering, doors/framing systems will be without damage or deterioration at time of substantial completion.

**END OF SECTION 08410**



## SECTION 08520 - ALUMINUM WINDOWS

### 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, grade and performance class of aluminum window units required is indicated on the drawings and schedules.
  - 1. Aluminum window units required are heavy commercial and architectural window grades of the performance class indicated.
- B. Types of aluminum window units required include the following:
  - 1. Aluminum Horizontal Sliding Type Windows.
  - 2. Aluminum Fixed Type Windows.
  - 3. Exterior and interior aluminum trim, closures, angles, etc.
  - 4. All hardware and weatherstripping for windows.
  - 5. Anchors, supports, weeps, brackets and similar elements.
  - 6. All metal to metal sealants.
  - 7. Metal Screens.
- C. Work of this section shall include field verification of existing dimensions, conditions and installation of windows.
- D. Related Sections:
  - 1. Section 07900 - Joint Sealer Assemblies.
  - 2. Section 08800 - Glass and Glazing.

#### 1.3 SYSTEM DESCRIPTION

- A. Design Requirements: Comply with air infiltration, water penetration and structural performance grade class designations according to AAMA/WDMA/CSA 101/I.S.2/A440-08 for the type, grade and performance class of window units required.
- B. Testing Requirements: Meet or exceed performance requirements for specified window classification as described in AAMA/WDMA/CSA 101/I.S.2/A440-08 and at the following minimum test sizes and without the use of any applied parts intended to enhance performance (Tests performed at smaller sizes than listed below shall not be acceptable):
  - 1. Horizontal Sliding- Double Sliders: 8'3" x 6'7"
  - 2. Fixed: 5'0" x 8'3"
- C. Uniform Structural Performance: For uniform load structural test, is equivalent to 150 percent of the design pressure. Provide window units which have been tested in accordance

with ASTM E330 and pass AAMA/WDMA/CSA 101/I.S.2/A440-08, with no failure or permanent deflection for a positive (inward) and negative (outward) test pressure as follows:

1. Horizontal Sliding - Double Sliders: 105 lbs./sq.ft.
  2. Fixed: 225 lbs./sq.ft.
- D. Uniform Load Deflection: No more than L/175 when tested per ASTM E 330-90 and pass AAMA/WDMA/CSA 101/I.S.2/A440-08 at:
1. Horizontal Sliding - Double Sliders: 70 lbs./sq.ft.
  2. Fixed: 150 lbs./sq.ft.
- E. Air Infiltration: Provide units with an air infiltration rate and inward test pressure indicated when tested in accordance with ASTM E283:
1. Air infiltration not more than 0.30 cfm / ft. of perimeter crack length with unit closed and locked. Test unit at a static air pressure difference of 6.24 lb./sq.ft.
- F. Water Penetration: Provide window units which have been tested in accordance with ASTM E331/ASTM E547 at a static air pressure difference of 12 lbs./sq.ft. With ventilator closed and locked.
1. There shall be no uncontrolled water leakage.
- G. Condensation Resistance: Provide window units which have been tested in accordance with AAMA 1503-1-88 at the prescribed test size and shall meet or exceed the following requirements:
1. CRF factor shall be a minimum of 50 for all window types.
  2. Conductive Thermal Transmittance (U-Value) shall not be more than the following at 15 mph. Perpendicular dynamic wind.
    - a. Horizontal Sliding -Double Sliders: .64 Btu/sq.ft.x h x deg F.
    - b. Fixed: .55 Btu/sq.ft.x h x deg F.

#### 1.4 SUBMITTALS

- A. Shop Drawings: Submit shop drawings for each type of window including information not fully detailed in the manufacturer's standard product data and the following:
1. Submit four copies of shop drawings for the assembly and erection of the window system, an the following:
    - a. Mullion details, including reinforcement and stiffeners.
    - b. Joinery details.
    - c. Weather-stripping details.
    - d. Thermal-break details.
    - e. Glazing details.
  2. Indicate clearly on all shop drawings any deviations from the Contract Drawings.

3. Include wall elevations at 1/4" scale, typical unit elevations at 1" scale and full size detail sections of every typical composite member.
  4. Show anchors, elements not included in manufacturer's standard data, including glazing details.
  5. It is understood that the dimensions of all materials shall be the Contractor's responsibility. Neither the Owner nor any representative thereof will be in any way responsible for the sizes shown nor will any such sizes be approved before production.
  6. The materials shown are expected to fit the job conditions, and the Contractor shall be fully responsible.
- B. Product Data: Submit manufacturer's product specifications, technical product data, recommendations and standard details for each type of aluminum window unit required.
1. Test Reports indicating compliance with ANSI/AAMA performance and thermal test requirements for type, grade and glazing requirements listed in specifications.
- C. Samples: Submit samples of the specified finish on 12" lengths of window members to the Architect for his approval. Such sample window shall be submitted within ten (10) days of the Architect's request.
1. The Architect reserves the right to require additional samples, which show fabrication techniques and workmanship, and design of hardware and accessories.
- D. Certification: Provide certification by the manufacturer showing that each type, grade and size of window unit complies with requirements where the manufacturer's standard window units have been tested in accordance with specified tests and meet performance requirements specified.
1. Where such testing has not been accomplished, perform required tests through a recognized testing laboratory or agency and provide certified test results.
  2. Certificates of Conformance: Submit written certification forms signed and notarized by authorized representatives of the Contractor / Installer / Manufacturer of the window system attesting that:
    - a. The referenced window systems have been furnished, inspected, and installed for this project in complete conformance with requirements of the Contract Documents,
    - b. The referenced window systems, covered under the work of this Contract, meet or exceed the requirements of the "Basis of Design", Project Specification requirements, without any reduction in the quality and performance
- E. Maintenance Data: For operable window sash, operating hardware and finishes to include in maintenance manuals.

F. Warranty:

1. Submit two (2) copies of written guarantee, signed by the Contractor, Installer and Manufacturer, agreeing to replace window work which fails in materials or workmanship within **ten (10) years** of the date of acceptance. Failure of materials or workmanship shall include but not be limited to excess air infiltration, excessive deflections, delamination of panels, deterioration of finish of metal in excess of normal weathering and defects in accessories, weatherstripping and other components of the work.

## 1.5 QUALITY ASSURANCE

- A. Standards: Requirements for aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in AAMA/WDMA/CSA 101/I.S.2/A440-08 and applicable general recommendation published by AAMA.
- B. Single Source Responsibility: Provide aluminum windows produced by a single manufacturer capable of showing prior production of units similar to those required. The firm engaged must be able to show successful experience in window work including a recommended ten years experience in the fabrication and erection of systems of scope and type similar to the required work.
- C. For the actual fabrication and installation of the windows, use only mechanics who are thoroughly trained and experienced in the skills required and who are completely familiar with the manufacturer's recommended methods of installation plus the requirements of this work.
- D. Engineering: Provide all materials fully processed, prefitted, prepunched, etc. and assure that the unit, when assembled, shall fit the openings so as not to require a cutting, ripping, or fitting on job site by the installing crews.
- E. Preinstallation Conference: If requested, conduct conference at project site to review methods and procedures related to aluminum windows including, but not limited to, the following:
  1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  2. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components.
  3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
  4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
- F. Special Project Warrantees: Provide special project warrantees and written guarantees, signed by the Contractor, Installer and Manufacturer, agreeing to replace window work which fails in materials or workmanship within **ten (10) years** of the date of acceptance.

1. Failure of materials or workmanship shall include but not be limited to excess air infiltration, excessive deflections, delamination of panels, deterioration of finish of metal in excess of normal weathering and defects in accessories, weatherstripping, failure of insulating glass and other components of the work.

## **1.6 PRODUCT HANDLING**

- A. Use all means necessary to protect the materials of this section before, during and after installation and to protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

## **1.7 STANDARDS**

- A. Comply with the applicable standards and recommendations published by NAAMM, AAMA and AA, including definitions of terms and designations not otherwise defined herein. For aluminum windows, comply with specifications and recommendations in ANSI A 302.9, unless more stringent requirements are listed in the following specifications.
- B. All tests referred to in these specifications shall be conducted by the recognized independent testing laboratory as approved by Architectural Aluminum Manufacturers Association.
  1. All tests must meet or exceed the values as set by the Architectural Aluminum Manufacturers Association, or contained herein, whichever standard is higher.

## **PART 2 – PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Basis of Design: Provide windows as manufactured by Architectural Window Manufacturing Corporation; or approved equal as follows:
  1. Horizontal Sliding - Double Slide: Series 6500i (AW-PG70) [4-1/4"]
  2. Fixed: Series 7700i (AW-PG150) [4-1/4"]
- 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 the following 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:

1. EFCO Corporation.
2. Graham Corporation
3. Or approved equal.

## 2.2 MATERIALS

- A. Frame Depths: All windows shall have minimum frame depth as shown on drawings and in accordance with Basis of Design window units indicated in Paragraph 2.1 above.
- B. Aluminum Extrusions: Provide alloy and temper recommended by the window manufacturer for the strength, corrosion-resistance, and application of required finish, but not less than 22,000 psi (150-Mpa) ultimate tensile strength, a yield of 16,000 psi (110-Mpa) in compliance with ASTM B 221, and not less than 0.080" thickness at any location for main frame and sash members, and not less than .0125" for aluminum frame sills (except projected windows which shall be .125" for all frame and sash members).
- C. Fasteners: Provide aluminum, non-magnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors and other components of window units.
  1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce the interior with aluminum or non-magnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
  2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match the finish of the member or hardware being fastened, as appropriate.
- D. Anchors, Clips and Window Accessories: Fabricate anchors, clips and window accessories of aluminum, non-magnetic stainless steel or hot-dip zinc coated steel or iron complying with the requirements of ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- E. Compression Type Glazing Strips and Weatherstripping: Unless otherwise indicated, and at the manufacturer's option, provide compressible stripping for glazing and weatherstripping such as molded EPDM or neoprene gaskets complying with AAMA/WDMA/CSA 101/I.S.2/A440-17.
- F. Sliding Type Weatherstripping: Provide woven pile weatherstripping of wool, polypropylene or nylon pile and resin-impregnated backing fabric, and aluminum backing strip. Comply with AAMA 701/702.
  1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semirigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
- G. Sealant: For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic, non-shrinking, and non-migrating. Comply with Division-7 "Joint Sealants" section of these specifications for selection and installation of sealants.

- H. Insect Screens: Provide insect screen units for each operable exterior sash or vent. Provide half screens for horizontal sliding window units only.
  - 1. Fabricate screen frames of extruded standard aluminum alloy tubular-shaped members of 0.050" minimum wall thickness complying with SMA 1004, with mitered or coped joints or corner extrusions and concealed mechanical fasteners. Provide removable PVC spline/anchor concealing the edge of the screen frame. Finish frames to match window units, unless otherwise indicated.
  - 2. Wire Fabric Insect Screen:
    - a. Aluminum Wire Fabric: Provide 18-by-16 (1.1-by-1.3-mm) mesh of 0.011-inch- (0.28-mm-) diameter, coated aluminum wire. Color of aluminum wire to match aluminum framing (Natural Bright, Charcoal Gray, Black).

### **2.3 WINDOW GRADES AND PERFORMANCE CLASSIFICATION**

- A. Architectural Windows: Provide window units complying with requirements of AAMA Grade and Performance Class indicated for each window type, as indicated in Paragraph 2.1 above.

### **2.4 WINDOW TYPES**

- A. General: The following paragraphs define the operating arrangement for the types of sash required in window units and specify minimum provisions for each type. Unless otherwise noted, the drawings indicate which panels of each window unit are operable sash and which are fixed.
  - 1. Where 2 or more types of operating sash are included in the same window unit, the operation of each is indicated, and the unit is considered a "Combination Aluminum Window."
- B. Horizontal-sliding windows are window units containing at least two horizontally-operable sash in a weathering frame. Provide window units with sash that can be removed from the inside for cleaning.
- C. Fixed windows are window units containing at least one fixed lite of glass in a weathering frame.
- D. Forced-Entry Resistance: Comply with Performance Grade 10 requirements when tested according to ASTM F 588.
- E. Life-Cycle Testing: Test according to AAMA 910 and comply with AAMA/WDMA/CSA 101/I.S.2/A440-08.
- F. Operating Force and Auxiliary (Durability) Tests: Comply with AAMA/WDMA/CSA 101/I.S.2/A440-08 for operating window types indicated.

### **2.5 HARDWARE**

- A. General: Except to the extent that more specific or stringent requirements are indicated, provide the manufacturer's standard hardware fabricated from aluminum, stainless steel

complying with AAMA 907, or other corrosion-resistant material compatible with aluminum and of sufficient strength to perform the function for which it is intended. Do not use aluminum in frictional contact with other metals.

- B. Locks and Latches: Designed to allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
- C. Window Types:
  - 1. Horizontal-Sliding Windows: Two stainless steel, lubricated roller assemblies with stainless steel ball bearing rollers; roller assemblies ride on stainless steel track covers for maximum durability and smooth operation; sash lock of spring-loaded black zinc die cast plunger lock with black anodized aluminum keeper at meeting rails plus one spring-loaded, aluminum snap-type lock at end jamb of the exterior sash.
  - 2. Fixed Windows: Not Applicable.

## **2.6 ACCESSORIES**

- A. General: Except to the extent that more specific or stringent requirements are indicated, provide the manufacturer's standard accessories that comply with indicated standards.
- B. Weatherstripping: Provide sliding-type weatherstripping at locations where sash rails slide horizontally or vertically along the unit frame. Unless otherwise indicated, provide double compression-type weatherstripping at the perimeter of each operating sash where sliding-type weatherstripping is not appropriate.
  - 1. Provide weatherstripping locked-in to extruded grooves in the sash.
- C. Glazing Stops: Aluminum to match windows, screwed or snapped on.
- D. Window Sills: New aluminum window sills shall be minimum 0.125" extruded aluminum profile as indicated on drawings or as selected by the Architect from manufacturer's available profiles to suit existing conditions. Drip leg shall lap down over masonry and upper leg shall project up behind window frame leg for watertight assembly without the need for caulk or sealant. Window sills shall be one piece and continuous without piecing. With the Architect's approval, extensive lengths will be allowed to have joints accomplished with under sill splice minimum of 4" with same profile as sill with all required sealants to achieve watertight seal. No over top sill splices will be allowed.

## **2.7 FABRICATION**

- A. General: Except to the extent that more specific or stringent requirements are indicated, provide manufacturer's standard fabrication that complies with indicated standards and that produces units that are reglazable without dismantling sash framing. Include a complete system for assembly of components and anchorage of window units, and prepare sash for glazing except where preglazing at the factory is indicated.
- B. Sizes and Profiles: Required sizes for window units and profile requirements are indicated on the drawings. Variable dimensions are indicated along with maximum and minimum dimensions as required to achieve design requirements and coordination with other work.



1. Details shown are based upon standard details by one or more manufacturers. Similar details by other manufacturers will be acceptable, provided they comply with size requirements, minimum/maximum profile requirements, and performance standards as indicated or specified.
- C. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed (products with exposed thermal barriers will not be acceptable), conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact.
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. No thermal short circuits shall occur between the exterior and interior.
  3. The thermal barrier shall be Ensigner's INSULBAR or approved equal, and consist of two glass reinforced polyamide nylon 6/6 struts mechanically crimped in raceways extruded in the exterior and interior extrusions.
  4. Poured and debridged urethane thermal barriers shall not be permitted.
- D. Provide weepholes and internal water passages to conduct infiltrating water to the exterior.
- E. Provide water-shed members above side-hinged ventilators and similar lines of natural water penetration.
- F. Provide subframes, receptors, with anchors for window units of extruded aluminum. Miter or cope corners, and weld and dress smooth with concealed mechanical joint fasteners. Finish to match window units.
- G. Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, in the manner indicated.
- H. Glazing Stops: Provide snap-on glazing stops, coordinated with glass selection and glazing system indicated. Finish glazing stops to match window units. Marine glazed windows will not be accepted.
- I. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440-08.
- J. Glazing: Windows shall be glazed with glazing types and systems as shown on drawings and in accordance with Section 08800.
- K. Insect Screens:
1. Locate screen units on either the inside or outside of the sash.

2. Where possible, design window units and hardware to accommodate screens in a tight-fitting removable arrangement, with a minimum of exposed fasteners and latches.
3. Provide color to match window framing.

## **2.8 FINISH AND COLOR**

- A. Class I, Color Anodic Finish: AA-M12C22A42/A44 etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker complying with AAMA 611.
  1. Color: Clear.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level.
- B. Masonry surfaces shall be visibly dry and free of excess mortar, sand and other construction debris.
- C. Metal surfaces shall be dry, clean, free of grease, oil, dirt, rust and corrosion, and welding slag, without sharp edges or offsets at joints.
- D. Inspect windows furnished by the manufacturer, verify existing dimensions and conditions, and provide all required additional aluminum trim and accessories to complete the installation.

### **3.2 INSTALLATION**

- A. Comply with drawings, shop drawings and manufacturer's written instructions and recommendations for installation of window units, hardware, operators, and other components of the work.
- B. Set units plumb, level and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
- C. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with the requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101-85.
- D. Set sill members and other members in a bed of compound or with joint fillers or gaskets, as shown, to provide weathertight construction. Refer to the "Joint Sealer" sections of Division-7 for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work.
- E. Compounds, joint fillers and gaskets to be installed after installation of window units are specified as work in another section in Division-7.

### **3.3 ADJUSTING**

- A. Adjust operating sashes, ventilators, screens, hardware and accessories to provide a tight fit at contact points and at weatherstripping, for smooth operation and a weathertight closure. Lubricate hardware and moving parts.

### **3.4 CLEANING**

- A. Clean aluminum surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt and other substances. Lubricate hardware and other moving parts.
- B. Clean glass of pre-glazed units promptly after installation of windows; comply with requirements of the "Glass and Glazing" section for cleaning and maintenance.

### **3.5 PROTECTION**

- A. Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of substantial completion.

### **3.6 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain window operating system.

**END OF SECTION 08520**

## **SECTION 08524 - BULLET RESISTANT TRANSACTION WINDOW**

### **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. Bullet Resistant Transaction Window.

#### **1.3 RELATED SECTIONS**

- A. Section 09250 - Gypsum Drywall.

#### **1.4 REFERENCES**

- A. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
- B. ASTM B 209/B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. NIJ Standard 0108.01 - (National Institute of Justice) Standard for Ballistic Resistant Protective Materials.
- D. Underwriters Laboratories: UL 752 - Standard for Bullet Resisting Equipment.

#### **1.5 PERFORMANCE REQUIREMENTS**

- A. Design, fabricate and install all partition materials specified in this section to meet or exceed the requirements of UL 752.

#### **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. Shop Drawings: Submit Manufacturer approved shop drawings detailing plan, section and elevation views as necessary to ensure proper field installation procedures. Coordinate locations with those listed in the Contract Drawings.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

#### **1.7 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a recommended minimum of ten (10) years experience.

- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a recommended minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
- C. Mock-Up: Provide a mock-up for evaluation 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 copy of the manufacturer's **standard limited warranty** against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

## PART 3 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Total Security Solutions, Fowlerville, MI, Tel: 888.839.6752 / 517-223-7807; Web: <http://www.tssbulletproof.com>; or approved equal.

### 2.2 COMPONENTS

- A. Glazing: Bullet Resistant Glazing:
  - 1. Glazing Type: Glass clad polycarbonate.
  - 2. Rating: UL 752 **Level 2**.
  - 3. Glazing Thickness: 1 inch (25mm).
  - 4. All panels finish 48 inches (1219mm) above the teller riser, 60 inches (1524mm) above the teller counter or to the underside of an existing soffit if lower than 100 inches (2540mm) Above the Finished Floor (A.F.F.).
- B. Aluminum Sections: Extruded aluminum alloy 6063 T5 manufactured in accordance with ASTM B209. Anodized or powder coated finish to match the existing decor and be free of sharp edges or burrs when in place.
  - 1. Glazing Channel: U-Channel specifically designed for securing transparencies tightly in place. Angles and stops are only acceptable for top attachment.

2. Door Frames: 1 3/4 inch by 4 inches by 1/8 min. (44mm x 102mm x 3mm) wall thickness. Anodized or powder coated finish to match the existing decor and be free of sharp edges or burrs when in place.

### **2.3 BULLET RESISTANT TRANSACTION MODULES**

- A. Construction:
  1. Rating: UL 752 **Level 2**.
  2. Frame: Steel, primed.
- B. Glazing: As specified in Article 2.2 of this section. Meets Underwriters Laboratories Standard 752 for bullet resistance and/or tested by H.P. White Laboratory for specified bullet resistance.
  1. Glazing Type: Glass clad polycarbonate.
- C. Voice Transmission:
  1. System Type: MK-1.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **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.

### **3.3 INSTALLATION**

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

### **3.4 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 08524**

## **SECTION 08700 - FINISH HARDWARE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this section

#### **1.2 DESCRIPTION OF WORK**

- A. The work in this section includes providing all labor, materials, appliances, and services required to completely furnish and deliver all finish hardware and related work, complete in accordance with the Architect's drawings and specifications, including, but not limited to the following:
  - 1. All finish hardware for FRP doors in aluminum frames and wood doors in hollow metal frames.
  - 2. All keying and cylinders.
  - 3. Furnish all finish hardware necessary to complete the project, whether particularly mentioned or not, and match in quality and finish the material specified.

#### **1.3 WORK NOT INCLUDED**

- A. Furnish finish hardware, except for certain noted items, under other sections for the following items:
  - 1. Toilet partitions
  - 2. Windows
  - 3. Washroom accessories
  - 4. Millwork
  - 5. Factory fabricated mechanical or electrical equipment.

#### **1.4 RELATED WORK IN OTHER SECTIONS**

- A. Refer to the following sections for these related items:
  - 1. Section 01030 – Alternate Bids.
  - 2. Section 07900 – Joint Sealer Assemblies.
  - 3. Section 08110 – Hollow Metalwork.
  - 4. Section 08211 - Wood Doors.
  - 5. Section 08410 - FRP Doors and Aluminum Framing Systems.
  - 6. Division 6 – Electrical Sections.

#### **1.5 QUALITY ASSURANCE**

- A. Manufacturer: Obtain each kind of material (latch and locksets, hinges, closers, etc.) from only one manufacturer of the respective item, although several may be indicated as offering products complying with requirements.

- B. Supplier: A recognized supplier, who has been furnishing Builders Hardware, in the project's vicinity, for a recommended period of not less than 3 years, and who is, or employs an experienced Architectural Hardware Consultant who is a recognized member of the Door and Hardware Institute, available at reasonable times during the course of the work, for consultation about the project's material requirements to the Owner, Architect, and Contractor. All hardware is to be supplied by one dealer.
- C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA 80. Provide only material which has been tested and listed by Underwriter's Laboratories, or other approved Testing Laboratories, for the types and sizes of doors required, and complies with requirements of Door and Frame labels.
- D. Where applicable, all hardware shall be in conformance with the State of New Jersey "Barrier-Free" sub code and ICC - ANSI A117.1

## **1.6 SUBMITTALS**

- A. Submittals shall conform to the requirements specified in Part 1.
- B. The hardware dealer shall submit to the Architect and/or Owner, at least six (6) copies of a detailed Hardware Schedule and Catalog Cut Sheets. These schedules shall be complete and describe in detail the finish hardware for all door openings, or occurrences of finish hardware. These schedules are to be checked and approved by the Contractor and Architect. No hardware is to be ordered nor templates issued, prior to the receipt, by the Hardware Dealer, of these approved schedules. Upon approval of the schedules, the Contractor shall supply the Architect with six (6) final copies.
- C. The finish hardware schedules submitted shall include information as indicated below. These schedules are intended for coordination of the work.
- D. Final finish hardware content: Based on materials indicated, organize schedule into "Hardware Sets", indicating complete destinations of every item required for each door or opening. Include the following information:
  - 1. Type, style, function, size and finish of each item.
  - 2. Name and manufacturer of each item including catalog cuts of each item.
  - 3. Fastenings and other pertinent information.
  - 4. Location of Hardware Set, cross-referenced to indications on drawings, both on floor plan and in door and frame schedule.
  - 5. Explanation of all abbreviations, symbols, codes, etc., contained in the schedule.
  - 6. Mounting locations for hardware.
  - 7. Wiring diagrams and electrical data.
- E. Submittal Sequence: Submit detailed finish hardware scheduled within 30 days of award of contract.



## 1.7 DELIVERY AND PACKAGING

- A. All items of finish hardware shall be delivered to the project site or applicable fabricators of doors and frames.
- B. Package each item of hardware and each lockset, separately in individual containers, complete with necessary screws, keys, instructions, and installation template for spotting mortising tools. Mark each container with item number corresponding to the number shown on the hardware schedule.
- C. Furnish wrapping for all knobs, handles, and pulls for protection during construction.

## 1.8 WARRANTY

- A. Guarantee workmanship and material provided against defective manufacture. Repair or replace defective workmanship and material appearing within period of **two (2) years** after substantial completion.
- B. Provide **twenty-five (25) year** factory warranty on door closers against defects in material and workmanship from date of occupancy of project.
- C. 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.
- D. Provide **ten (10) year** factory warranty on locksets against defects in material and workmanship from date of occupancy of project.

## 1.9 JOB CONDITIONS

- A. Field Service: Hardware Supplier: Assign a competent representative, acceptable to the Architect to be at the jobsite each time a major shipment of finish hardware is received. Such representative shall assist in "checking in" these shipments and shall secure a receipt covering the contents of each shipment. In addition, such representative shall be available for immediate call to the jobsite when, in the opinion of the Architect, their presence is necessary.
- B. Templates: Following approval of the Hardware Schedule by the Architect, furnish and deliver template information to the fabricators of items to which finish hardware is to be applied in ample time to avoid delays in such work of said fabricators. Provide drawings, schedules and detailed information to other trades as necessary for them to accommodate and prepare their work to receive the finish hardware.
- C. Cooperation and Coordination:
  - 1. Cooperate and coordinate work with that of other trades supplying materials or performing work in contact with, connecting to, underlying, or overlaying the work of this Section.
  - 2. Provide complete data of requirements for work of this Section to those other trades whose work is affected by or dependent upon the work of this Section.

3. Furnish all items to be built into other work in ample time to avoid delaying the progress of such work.
  4. Examine all drawings covering the work of this Section and refer to all other drawings, including mechanical and electrical drawings, which may affect the work of this Section or require coordination by this trade.
- D. Existing Conditions: Hardware supplier: Verify all existing conditions in the field to ensure compatibility with finish hardware specified in Hardware Sets herein, prior to submission. Any discrepancies between the existing field conditions and finish hardware specified shall be brought to the attention of the Architect immediately. Hardware supplier shall not order any finish hardware until all discrepancies are rectified and the Architect grants written approval.

#### **1.10 GENERAL**

- A. The material called for under this section shall provide for all of the hardware required, whether the same is particularly specified or not. If the hardware for any particular location is not described herein, it should be provided and shall be like that specified for similar locations so far as practicable. If no similar locations are specified, such hardware must be of a suitable type approved by the Architect.
- B. Provide screws of proper type and compatible material, with shields, anchors, plugs, toggle nuts, etc., as required for the attachment of all items of hardware herein specified. All exposed screws shall have flat head, Phillips-type heads and shall be finished to match the item of hardware for which it is intended.

#### **1.11 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final **hardware and keying** schedule.

#### **1.12 MAINTENANCE SERVICE**

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

### **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.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
  1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

- C. Substitutions: Requests for substitution and product approval for inclusive mechanical 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. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:
  - a. Two Hinges: For doors with heights up to 60 inches.
  - b. Three Hinges: For doors with heights 61 to 90 inches.
  - c. Four Hinges: For doors with heights 91 to 120 inches.
  - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
  - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
  - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
  - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
  - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
  - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
5. Manufacturers:
  - a. Bommer Industries (BO).
  - b. Hager Companies (HA).
  - c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
  - d. Or approved equal.

- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:
  - a. Bommer Industries (BO).
  - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).

- c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
- d. Or approved equal.

### 2.3. DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
  - 1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
  - 2. Furnish dust proof strikes for bottom bolts.
  - 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
  - 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
  - 5. Manufacturers:
    - a. Door Controls International (DC).
    - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    - c. Trimco (TC).
    - d. Or approved equal.
- B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.
  - 1. Manufacturers:
    - a. Door Controls International (DC).
    - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    - c. Trimco (TC).
    - d. Or approved equal.
- C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
  - 1. 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.
  - 5. Manufacturers:
    - a. Hiawatha, Inc. (HI).
    - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    - c. Trimco (TC).
    - d. Or approved equal

## 2.4. CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years' experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
  - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
  - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
  - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  - 5. Keyway: Match Facility Standard.
- D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
  - 1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
  - 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
  - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  - 3. Existing System: Key locks to Owner's existing system.
- F. Key Quantity: Provide the following minimum number of keys:
  - 1. Change Keys per Cylinder: Three (3).
  - 2. Master Keys (per Master Key Level/Group): Five (5).
  - 3. Construction Keys (where required): Ten (10).
  - 4. Construction Control Keys (where required): Two (2).
  - 5. Permanent Control Keys (where required): Two (2).
- G. Construction Keying: Provide temporary keyed construction cores.
- H. Key Registration List (Bitting List):
  - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
  - 2. Provide transcript list in writing or electronic file as directed by the Owner.
- I. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
  - 1. Manufacturers:

- a. Lund Equipment (LU).
  - b. MMF Industries (MM).
  - c. Telkee (TK).
  - d. Or Approved Equal.
- J. 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.

## **2.5. MECHANICAL LOCKS AND LATCHING DEVICES**

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
  2. Locks are to be non-handed and fully field reversible.
  3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.
  4. Manufacturers:
    - a. Stanley Best (BE) - 9K
    - b. Corbin Russwin Hardware (RU) – CL3300 Series.
    - c. Sargent Manufacturing (SA) – 10 Line.
    - d. Or Approved Equal.

## **2.6. LOCK AND LATCH STRIKES**

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
  4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
  2. Strikes for Bored Locks and Latches: BHMA A156.2.
  3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
  4. Dustproof Strikes: BHMA A156.16.

## **2.7. CONVENTIONAL EXIT DEVICES**

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
  2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
  3. Except on fire rated doors, provide exit devices with key cylinder dogging device to hold the pushbar and latch in a retracted position.
  4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
  5. Flush End Caps: Provide 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 escutcheon trim with threaded studs for thru-bolts.
    - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
  7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
  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. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:
  - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
  - b. Sargent Manufacturing (SA) - 80 Series.
  - c. Von Duprin (VD) - 35A/98 XP Series.
  - d. Or Approved Equal
  
- C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.
  1. Provide keyed removable feature where specified in the Hardware Sets.
  2. Provide stabilizers and mounting brackets as required.
  3. Provide electrical quick connection wiring options as specified in the hardware sets.
  4. Manufacturers:
    - a. Corbin Russwin Hardware (RU) - 700/900 Series.
    - b. Sargent Manufacturing (SA) - 980S Series.
    - c. Von Duprin (VD) - 9954 Series.
    - d. Or Approved Equal

## **2.8. DOOR CLOSERS**

- A. All door closers specified herein shall meet or exceed the following criteria:
  1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
  2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
  3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
  4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
  5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
  6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
  7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.



- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
  - a. Corbin Russwin Hardware (RU) - DC8000 Series.
  - b. Sargent Manufacturing (SA) - 351 Series.
  - c. Norton Door Controls (NO) - 7500 Series.
  - d. Or Approved Equal

## **2.9. DOOR STOPS AND HOLDERS**

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:
  - a. Hiawatha, Inc. (HI).
  - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
  - c. Trimco (TC).
  - d. Or Approved Equal

- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:
  - a. Rixson Door Controls (RF).
  - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
  - c. Sargent Manufacturing (SA).
  - d. 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 NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
1. National Guard Products (NG).
  2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
  3. Reese Enterprises, Inc. (RE).
  4. Or Approved Equal

## **2.11. ELECTRONIC ACCESSORIES**

- A. Switching Power Supplies: Provide switching power supplies that are dual voltage, UL listed, supervised units. Units shall be field selectable with a dedicated battery charging circuit that provide 4 Amp at 12VDC or 24VDC continuous, with up to 16 independently controlled power limited outputs. Units shall tolerate brownout or overvoltage input  $\pm 15\%$  of nominal voltage and have thermal shutdown protection with auto restart. Circuit breaker shall protect against overcurrent and reverse battery faults and units shall be available with a single relay fire trigger or individually triggered relayed outputs. 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. Manufacturers:
    - a. Securitron (SU) - AQ Series.
    - b. 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.

## **2.14. HARDWARE SUPPLIER'S RESPONSIBILITY**

- A. The finish hardware listed herein shall in no way be construed as a complete hardware schedule and shall be considered as an indication of the finish hardware requirements desired by the Owner. It shall be the finish hardware supplier's responsibility to examine the drawings and door schedule, and provide all necessary or additional hardware as required, but not specified herein. Such items of finish hardware shall be of the same type, quality, and quantity as that scheduled for similar doors used for similar purposes in other parts of the building. A schedule of fabrication and delivery shall be executed to avoid any delay of the entire project.

## **2.15. HARDWARE SUPPLIER'S RESPONSIBILITY**

- A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.
- C. Products listed in the Door Hardware Sets must meet the requirements described in the specification sections noted.
  - 1. Section 08700 – Finish Hardware.
  - 2. Division 6 - Electrical Section(s).
- D. Manufacturer's Abbreviations:
  - 1. MK - McKinney
  - 2. PE - Pemko
  - 3. RO - Rockwood
  - 4. RU - Corbin Russwin
  - 5. OT - Other
  - 6. HS - HES
  - 7. NO - Norton
  - 8. SU - Securitron

## Hardware Sets

### Set: 1.0

Doors: 120B, 121B, 121E, 122B, 122E

0 All Hardware BY DOOR SUPPLIER OT

### Set: 2.0

Doors: 101A

2	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Fixed Mullion	CR910		RU
1	Rim Exit Device, Exit Only	ED5200 EO	630	RU
1	Rim Exit Device, Nightlatch	ED5200 K157ET x LC	630	RU
2	Cylinder (mortise / rim)	CR1040 (or) CR3040 CTSD	630	RU
2	Cylinder Core	MATCH EXISTING	626	OT
1	Electric Strike	9600	630	HS
1	Bridge Rectifier	2005M3		HS
2	Door Pull	BF158 Mtg-Type 12HD	US32D	RO
2	Door Closer	CPS7500	689	NO
2	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Threshold	272A MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (mullion)	5110BL		PE
2	Sweep (w/drip edge)	3452CNB		PE
2	Door Position Switch	DPS2-M-BK		SU
1	Push Button	PB3ER		SU
1	Power Supply	AQD2-8C8R1		SU

Notes: Locate remote release push button with architect in the field.

Electronic Operation: Remote release push button releases electric strike or key retracts latchbolt.

Free egress at all times. In case of power loss, door remains locked and latched.

### Set: 3.0

Doors: 114, 120D, 121A, 121D, 122A, 122D

1	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED5200 K157ET x LC	630	RU
1	Cylinder (mortise / rim)	CR1040 (or) CR3040 CTSD	630	RU
1	Cylinder Core	MATCH EXISTING	626	OT
1	Door Pull	BF158 Mtg-Type 12HD	US32D	RO
1	Door Closer	CPS7500	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Threshold	279x224AFGT MSES25SS		PE
1	Rain Guard	346C		PE
1	Sweep (w/drip edge)	3452CNB		PE
1	Door Position Switch	DPS2-M-BK		SU

**Set: 4.0**

Doors: 101B

2	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Mullion	CR910		RU
1	Rim Exit Device, Exit Only	ED5200 EO	630	RU
1	Rim Exit Device, Nightlatch	ED5200 K157ET x LC	630	RU
2	Cylinder (mortise / rim)	CR1040 (or) CR3040 CTSD	630	RU
2	Cylinder Core	MATCH EXISTING	626	OT
1	Electric Strike	9600	630	HS
1	Bridge Rectifier	2005M3		HS
2	Door Pull	BF158 Mtg-Type 12HD	US32D	RO
2	Door Closer	CPS7500	689	NO
2	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Gasketing (mullion)	5110BL		PE
1	Push Button	PB3ER		SU
1	Power Supply	AQD2-8C8R1		SU

Notes: Locate remote release push button with architect in the field.

Electronic Operation: Remote release push button releases electric strike or key retracts latchbolt. Free egress at all times. In case of power loss, door remains locked and latched.

**Set: 4.1**

Doors: 120A Single card access

1	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED5200 K157ET x LC	630	RU
1	Cylinder (mortise / rim)	CR1040 (or) CR3040 CTSD	630	RU
1	Cylinder Core	MATCH EXISTING	626	OT
1	Electric Strike	9600	630	HS
1	Bridge Rectifier	2005M3		HS
1	Door Pull	BF158 Mtg-Type 12HD	US32D	RO
1	Door Closer	CPS7500	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Threshold	272A MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (mullion)	5110BL		PE
1	Sweep (w/drip edge)	3452CNB		PE
1	Door Position Switch	DPS2-M-BK		SU
1	Push Button	PB3ER		SU
1	Power Supply	AQD2-8C8R1		SU

Notes: Locate remote release push button with architect in the field.

Electronic Operation: Remote release push button releases electric strike or key retracts latchbolt. Free egress at all times. In case of power loss, door remains locked and latched.

**Set: 5.0**

Doors: 110, 113

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Storeroom Lock	CL3357 NZD CTSD	626	RU
1	Cylinder Core	MATCH EXISTING	626	OT
1	Door Closer	R7500 (or) PR7500	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
1	Gasketing (head/jamb)	S88BL		PE

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**Set: 6.0**

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Storeroom Lock	CL3357 NZD CTSD	626	RU
1 Cylinder Core	MATCH EXISTING	626	OT
1 Door Closer	R7500H (or) PR7500H	689	NO
1 Kick Plate	K1050 10" CSK BEV	US32D	RO
1 Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
3 Silencer	608 (or) 609		RO

Notes: \*\*\*SET NOT USED\*\*\*

**Set: 7.0**

Doors: 118

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Storeroom Lock	CL3357 NZD CTSD	626	RU
1 Cylinder Core	MATCH EXISTING	626	OT
1 Door Closer	CLP7500	689	NO
1 Kick Plate	K1050 10" CSK BEV	US32D	RO
3 Silencer	608 (or) 609		RO

**Set: 8.0**

Doors: 119, 120C, 121C, 122C

6 Hinge, Full Mortise	TA2714	US26D	MK
1 Dust Proof Strike	570	US26D	RO
2 Flush Bolt (manual)	555 (or) 557	US26D	RO
1 Classroom Lock	CL3355 NZD CTSD	626	RU
1 Cylinder Core	MATCH EXISTING	626	OT
1 Door Closer	R7500 (or) PR7500	689	NO
2 Kick Plate	K1050 10" CSK BEV	US32D	RO
2 Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
1 Threshold (5/16")	166A MSES10SS		PE
1 Gasketing (head/jamb)	S88BL		PE
2 Sweep	315CN		PE
1 Astragal	357SP		PE
1 Astragal	S771C		PE

**Set: 9.0**

Doors: 104

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Classroom Lock	CL3355 NZD CTSD	626	RU
1 Cylinder Core	MATCH EXISTING	626	OT
1 Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
3 Silencer	608 (or) 609		RO

**Set: 10.0**

Doors: 107, 108, 109, 112

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Classroom Lock	CL3355 NZD CTSD	626	RU
1 Cylinder Core	MATCH EXISTING	626	OT
1 Door Closer	R7500 (or) PR7500	689	NO
1 Kick Plate	K1050 10" CSK BEV	US32D	RO
1 Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
1 Gasketing (head/jamb)	S88BL		PE

**Set: 11.0**

Doors: 117

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Storeroom Lock	CL3357 NZD CTSD	626	RU
1 Cylinder Core	MATCH EXISTING	626	OT
1 Door Closer	CLP7500	689	NO
1 Kick Plate	K1050 10" CSK BEV	US32D	RO
1 Gasketing (head/jamb)	S88BL		PE

**Set: 12.0**

Doors: 105, 106

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Privacy Lock	CL3320 NZD	626	RU
1 Mop Plate	K1050 4" CSK BEV	US32D	RO
1 Kick Plate	K1050 10" CSK BEV	US32D	RO
1 Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
1 Gasketing (head/jamb)	S88BL		PE
1 Coat Hook	RM801	US32D	RO

**Set: 13.0**

Doors: 115, 116

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Passage Latch	CL3310 NZD	626	RU
1 Door Closer	R7500 (or) PR7500	689	NO
1 Mop Plate	K1050 4" CSK BEV	US32D	RO
1 Kick Plate	K1050 10" CSK BEV	US32D	RO
1 Door Stop (wall / floor)	403 (or) 441CU	US26D	RO
1 Gasketing (head/jamb)	S88BL		PE

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Mount Hardware units at heights indicated in “recommended locations for Builders Hardware for Standard Steel Doors and Frames”, by the Door and Hardware Institute, except as specifically indicated, required to comply with governing regulations, or may be otherwise directed by the Architect.
- B. Install each hardware item in compliance with the manufacturer’s instruction and recommendations. Wherever cutting and fitting is required to install finish hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

### **3.2 ADJUST AND CLEAN**

- A. Adjust and check each operating item of finish hardware and each door to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Final adjustment: Wherever finish hardware installation is made more than one month prior to acceptance of occupancy of a space or area, return to the work site during the week prior to acceptance or occupancy, and make final check and adjustment of all finish hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of finish hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct Owner’s personnel in proper adjustment and maintenance of finish hardware finishes during the final adjustment of finish hardware.
- D. Continued Maintenance Service: Approximately six months after the acceptance of finish hardware in each area, the installer, accompanied by the representative of the lock and latch manufacturer shall return to the project and re-adjust every item of finish hardware to restore proper function of doors and finish hardware. Consult with and instruct Owner’s personnel in recommended additions to the maintenance procedures. Replace finish hardware items that have deteriorated or failed due to faulty design, materials or installation of finish hardware units.

**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 08110 - Hollow Metalwork
  - 2. Section 08211 - Wood Doors
  - 3. Section 08410 - FRP Doors and Aluminum Framing Systems
  - 4. Section 08520 - Aluminum Windows

#### **1.2 SUMMARY**

- A. Extent of glass and glazing work is indicated on drawings and schedules.
- B. Type of work or locations requiring glass and glazing includes, but is not limited to, glass types scheduled herein and on the drawings.
  - 1. Windows.
  - 2. Doors.
  - 3. Interior borrowed lites.

#### **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. Fire-Rated Window 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 257.
- D. 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).
- E. 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).
  
- F. 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.
  
- G. 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.
  
- H. All glass shall bear the Label of the manufacturer.
  
- I. 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 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 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. Firelite Plus by TGP Technical Glass Products
  - b. SuperLite II-XL by Safli First, a Division of O'Keeffe's Inc.
  - c. Keralite L by Vetrotech Saint-Gobain North America
  - d. Pyran® Platinum by Schott Glass Products
  - e. 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. Heat Treated Float Glass (Tempered Glass): ASTM C 1048; Type I; Quality-Q3; Class I (clear)
  1. Provide prime glass of color and type indicated, which has been heat treated to strengthen glass in bending to not less than 4.5 times annealed strength.
- C. 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 **clear**, with visible light transmittance of 70% and shading coefficient of 0.44 for 1/4" thick glass.
- D. Energy Advantage Low-E Glass: Manufacturer's standard clear color Low-E glass, coated on third surface with light transmittance:
  1. Clear: 33% and shading coefficient of .44 for 1/4" thick glass.

## 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, 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.

## 2.4 FIRE-RATED / IMPACT GLAZING AND FRAMING ASSEMBLIES

- 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. Fire-rated for up to 180 minutes in doors with required hose-stream test.
    - f. 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 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.

## **2.6 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.

## **2.7 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 08871 - SECURITY GLAZING

### PART 1 – GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes the following where indicated on the drawings:
  - 1. Insulated Security Glass Units
- B. Related Sections:
  - 1. Section 08410 – Aluminum/FRP Doors and Aluminum Framing Systems

#### 1.03 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Provide glazing systems produced by a manufacturer with a recommended 5-years successful experience in the fabrication of assemblies of the type and quality required.
- B. Installer’s Qualifications: Glazed systems shall be installed by a firm with a recommended 5-years successful experience in the installation of systems like those required.

#### 1.04 ACTION SUBMITTALS

- A. Samples: Submit 12-inch square samples of each glass product. Submit 6-inch-long samples of glazing sealant and glazing tape, for color review.
- B. Manufacturer’s Data: Submit manufacturers’ technical data and instructions for installing and maintaining each glazing material

#### 1.05 EXTENDED WARRANTIES

- A. General: Submit warranties provided by the manufacturer agreeing to repair or replace defective material or workmanship within the specified warranty periods, starting from the date of substantial completion.
  - 1. Insulated Security Glass Units: Submit a **ten (10) year** warranty against defects including loss of seal, interior clouding, and discoloration.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURER

- A. Security Glazing Manufacturers and Fabricators: Subject to compliance with requirements, firms producing glass products which may be incorporated into the work include the following:

1. Armoured One, LLC: Syracuse, NY; Tel.# 888.559.5255 / 315.720.4186, [www.armouredone.com](http://www.armouredone.com); [Local Rep. Joe Boltzer, Tel.# 732.596.9833]; or approved equal.
  - a. Product: AOTSG1IGU – 1-inch Insulated Security Glass Unit

### **2.03 AOTSG1IGU - INSULATED SECURITY GLASS UNITS**

- A. Thickness: 1-inch Clear
- B. ASTM C1172 – Standard Specification for Laminated Architectural Flat Glass
- C. WEY-SA-C3 – Standard for shooter/attack certification and forced entry class 3.
- D. GSA Level C – General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings.
- E. ASTM F1642 – Standard Test Method for Glazing and Glazing Systems Subject to Air blast Loadings.
- F. UL972 – Standard for Burglary Resisting Glazing.
- G. EN356 P4 – Testing and Classification of Resistance Against Manual Attack.
- H. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- I. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Consumer Products Safety Commission; current edition.
- J. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.

### **2.04 GLAZING MATERIALS**

- A. General: Provide standard color of glazing materials as selected by Architect. Comply with manufacturer's recommendations for applications and conditions at time of installation.
- B. Polyurethane Glazing Gasket: Polyurethane gasket or stick tape, color to be selected by Architect, thickness and size as shown on drawings.
- C. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- D. Setting Blocks: Neoprene, silicone or EPDM, 70-90 durometer hardness, with proven compatibility with glazing materials used.
- E. Spacers: Neoprene, silicone or EPDM, 40-50 durometer hardness with proven compatibility with glazing materials used.
- F. Compressible Fillers: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25% deflection.
- G. Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
  1. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D.

- H Dowsil 995 – Dow Corning Corp. (Applied to interior of vision kit to adhere security glazing to the interior or the frame.); or approved equal.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. Glazing installation must withstand normal temperature changes, and impact loading without failure of glass, failure of sealants or gaskets, deterioration of glazing materials and other defects in the work.
- B. Protect glass from damage during handling and installation, and subsequent operation of glazed components of the work. Discard units with edge damage or other imperfections.
- C. Glazing channel dimensions are intended to provide for necessary bite on glass, minimum edge clearance, and adequate tape or sealant thicknesses, with reasonable tolerances.
- D. Comply with recommendations by manufacturers of glass and glazing products, except where more stringent requirements are indicated, including those of referenced glazing standards.

### **3.02 PREPARATION**

- A. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrate.
- B. Where sealants are used, apply primer or sealant to joint surfaces where recommended by sealant manufacturer.

### **3.03 GLAZING**

- A. Where indicated, provide spacers for size and spacing required for glass sizes larger than 50 united inches, except where gaskets or pre-shimmed tapes are used for glazing. Provide 1/4-inch minimum bite of spacer on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- B. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- C. Where sealants are used at butt joints, apply sealant in thin continuous clear bead. Tool sealant to a uniform, continuous, even profile.
- D. Using DOW 995 structural sealant, bond the security glazing to interior of frame, by adding a bead of sealant to the edges of glazing and the framing on both sides of glazing.
- E. Apply glazing stops and clean up any excess structural sealants from finished surfaces.

### **3.04 PROTECTION AND CLEANING**

- A. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

- B. 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 08871**

## **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. Water-resistant gypsum wallboard
  - 4. Sound Insulation
  - 5. Drywall finishing (joint tape and compound treatment)
  - 6. Vinyl trim and accessories
- C. Related Sections:
  - 1. Section 09300 - Tile
  - 2. 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 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. Metal Furring Support Materials
1. Roll-formed, hat-shaped sections made of 20-ga. Corrosion-resistant steel. Designed for screw attachment of gypsum panels. Size 7/8" x 2-9/16"; length 12', 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; or approved equal.



## **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, Water-Resistant Gypsum Board and Tile Backer: ASTM C1178, and as follows: (Paintable)
  - 1. Thickness: 5/8 inch, unless otherwise indicated.
  - 2. Materials shall be mold resistance.
  - 3. Provide at showers, toilet rooms and where indicated.
  - 4. Basis of Design: "Fiberock - Brand Aqua"; United States Gypsum Co.; or approved equal.

## **2.4 VAPOR RETARDER**

- A. Polyethylene sheet, 8 mil thick, formed by spinning continuous strands of fine, high-density polyethylene interconnected fibers and bonding them together by heat and pressure; incorporating an additive to provide ultraviolet resistance for up to 120 days; with a water-vapor transmission rate equaling 669 g in 24 hours through 1 sq. m of surface per ASTM E96 procedure B and flame-spread and smoke-developed ratings of 0 and 25, respectively, per ASTM E84.

## **2.5 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.

## **2.6 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.

## **2.7 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.

## **2.8 SOUND ATTENUATION BLANKETS**

- A. Products shall be in accordance with ASTM C665-84, Type I semi-rigid unfaced mineral fiber blanket, Class 25 flame spread, thickness as indicated, and/or to achieve a minimum of STC 50 rating for indicated assemblies.

## **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 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 runners 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.

### **3.3 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. Install sound attenuation blankets at all partitions prior to gypsum board unless readily installed after board has been installed.

- C. Locate exposed end-butt joints as far from center of walls as possible, and stagger not less than 24 inches in alternate courses of board.
- D. Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible.
- E. 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.
- F. 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.
- G. Attach gypsum board to framing and blocking provided for additional support at openings and cutouts.
- H. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.)
- I. 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.
- J. 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.
- K. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum board over wood framing, with "floating" internal corner construction.
- L. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

### **3.4 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.

### **3.5 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.

### **3.6 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 where areas are to receive gloss, semi-gloss, enamel or non-textured flat paints.

### **3.7 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.

### **3.8 VAPOR BARRIER INSTALLATION**

- A. Installation of Vapor Retarder:
  - 1. General: Install polyethylene vapor retarder on interior side of cold metal framing members of exterior insulated walls, to comply with the following requirements:

- a. Extend vapor retarder to extremities of exterior insulated walls and to cover miscellaneous voids in insulated substrate, including those which stuffed with loose thermal insulation.
- b. Place vertical joints in vapor retarders over framing by lapping not less than two (2) wall studs. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and lap joints; space fasteners at 16 inches on center.
- c. Seal all joints in vapor retarder including joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with cloth or aluminized tape which bonds permanently to vapor retarder.
- d. Repair any tears or punctures and seal all joints in vapor retarder immediately before concealment by application of gypsum board or other construction.

### **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 09300 - TILE**

### **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: Tile includes ceramic surfacing units made from clay or other ceramic materials.
- B. Extent of tile work is indicated on the drawings and schedule.
- C. Type of tile work in this section includes the following:
  - 1. Quarry Tile.
  - 2. Marble thresholds.
- D. Related Work:
  - 1. Preparation for concrete slab: Section 03300.

#### **1.3 QUALITY ASSURANCE**

- A. Tile manufacturing standard: ANSI 137.1. Furnish tile complying with Standard Grade requirements unless indicated otherwise.
- B. Proprietary Materials: Handle, store, mix and apply proprietary setting and grouting materials in compliance with manufacturer's instructions.
- C. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
- D. Flooring shall comply with ANSI A137.1 American National Standard Specifications for Ceramic Tile, current edition.
- E. Installer Qualifications:
  - 1. Installer employs Ceramic Tile Education Foundation Certified Installers for Project.
  - 2. Installer employs factory trained installers for the Project.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials.
- B. Samples for Initial Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection.

- C. Samples for Verification Purposes: Submit the following:
  - 1. Samples for each type of tile and for each color and texture required, not less than 12" square, on plywood or hardboard backing and grouted.
  - 2. Full size samples for each type of trim, accessory and for each color.
  - 3. 6" long samples of stone thresholds.
  - 4. Samples of metal edge strip.
- D. Certification: Furnish Master Grade Certificates for each shipment and type of tile, signed by manufacturer.
- E. Slip-Resistant Tile:
  - 1. ASTM E303, Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester, and has been endorsed by the Ceramic Tile Institute of America (CTIOA) for all types of flooring since 2001
  - 2. Submit manufacturer's test data for slip-resistant tile. Tests shall be in conformance with indicated applicable codes and regulations.

## **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

## **1.6 PROJECT CONDITIONS**

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at not less than 50°F (10°C) in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

## **1.7 MAINTENANCE MATERIALS**

- A. Furnish extra materials that match and are from the same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3% of amount installed for each type, composition, color, pattern and size indicated.
  - 2. Grout: Furnish quantity of grout equal to 3% of amount installed for each type, composition, color indicated.



## 1.8 WARRANTY

### A. Limited Warranty:

1. Manufacturer warrants that manufactured products will be free from defect for a period of **one (1) year** from date of purchase.
  - a. Defect is defined as a shortfall in the product to perform to manufacturer's specifications as disclosed in product literature, within industry allowable tolerances as set forth in standard, national industry protocols.
  - b. Manufacturer provides detailed information in its product literature regarding appropriate tile and stone applications. Failure to comply with recommended applications voids this warranty.
  - c. This one-year express warranty is the sole warranty extended and replaces any statutory warranties to the maximum extent allowable by law.

### B. Epoxy Grout: DS 230.10: **Ten (10) Year** System Warranty.

## 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. Manufacturers of Unglazed Quarry Tile:
    - a. American Olean Tile Co., Inc.
    - b. Dal-Tile Corp.
    - c. Summitville Tiles, Inc.
    - d. Or approved equal.

### 2.2 TILE PRODUCTS

- #### A. Quarry Tile: Provide flat tile complying with the following requirements:
1. Wearing Surface: Slip-resistant tile without abrasive content "Quarry Textures"; Dal-Tile Corp., or approved equal.
  2. Nominal Facial Dimensions: 6" x 6", 8" x 8" as selected by the Architect. Allow for any pattern, (in any areas other than Kitchen Area), including 45 degree layouts as selected by Architect. A
  3. Nominal Thickness: 1/2".
  4. Face: Plain.
  5. Base: 5" high.

6. Temporary Wax Coating: Protect exposed surfaces of quarry tile against adherence of mortar and grout where indicated below by precoating with wax to produce a continuous film. Use wax which is approved by manufacturers of both tile and grout as being compatible with their materials and with the cleaning method required to remove wax without damage to tile or grout. Apply wax in manner to avoid coating unexposed tile surfaces and edges; handle tile to prevent waxed surfaces from contacting backs or edges of other units.

### **2.3 THRESHOLDS**

- A. Stone Thresholds: Provide sound Group "A" marble threshold of profile indicated with an abrasive hardness of not less than 10.0 when tested in accordance with ASTM C 241. Maximum height ½" above finished floor. Furnish white marble for thresholds, unless otherwise indicated.

### **2.4 COLORS AND PATTERNS**

- A. As selected by Architect from manufacturer's full color line (including premium colors - Groups 2 through 5) and patterns of each type tile specified. Patterns shall be defined as using not more than 3 different colors of tile in any given area, applied in stripes, diagonals, checkerboard pattern or 45 degree layouts and other designs as determined by the Architect. All selections shall be made from manufacturer's full product lines (including premium colors).

### **2.5 SETTING AND GROUTING MATERIALS**

- A. Portland Cement Mortar Installation Materials: Provide materials to comply with ANSI Standards as required for installation method designated, unless otherwise indicated.
- B. Epoxy Grout: Proprietary compound composed of portland cement with latex additive for a more flexible and less permeable grout. Color as selected by Architect from manufacturer's standard.
  1. Basis of Design: "Spectralock® Pro Premium Grout®", as manufactured by Laticrete International, Inc.; or approved equal.
  2. High performance epoxy grout which offers excellent color uniformity, durability, stain protection, and beautiful, full grout joints in an easy-to-use, non-sag formula.
  3. 80 minutes working time at 70°F (21 degrees C).
  4. Equipped with anti-microbial technology.
  5. Meets performance requirements of ANSI A118.3.
  6. Ideal for installations at wide temperature ranges.
  7. ISO 13007-3 RG and EN 13888 RG.
  9. Outperforms cement based grout.

10. Products offered by manufacturers to comply with requirements include the following:
  - a. Ardex Americas.
  - b. Mapei Corporation.
  - c. Or approved equal.

## **2.6 MISCELLANEOUS MATERIALS**

- A. Tile Cleaner: Product specifically acceptable to manufacturer of tile and grout manufacturer for application indicated and as recommended by National Tile Promotion Federation, 112 North Alfred St., Alexandria, VA 22134 or Ceramic Tile Institute, 700 N. Virgil Ave., Los Angeles, CA 90029. Provide a neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- B. Grout and Tile Sealer: Manufacturer's standard product for sealing tile and grout joints that does not change color or appearance of grout.
  1. Provide colorless and stain resistant penetrating sealer with Ph factor between 7 and 10, that does not affect color or physical properties of tile surfaces.
  2. Products:
    - a. Custom Building Products; Surfaceguard Tile and Grout Sealer.
    - b. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
    - c. Or approved equal.
  3. Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- C. WATERPROOFING MATERIALS:
  1. Sheet Membrane: 0.030 inch thick chlorinated polyethylene (CPE) sheet with nonwoven polyester laminated to both sides, 60 inches wide.
  2. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
    - a. "Dal-Seal TS"; by Dal-Tile Corporation; or approved equal.
- D. Waterproofing / Crack Isolation Membrane at Porcelain Tile installation:
  1. Basis of Design: "Hydroban®" as manufactured Laticrete International, Inc.; or approved equal.
  2. Single component self-curing liquid rubber polymer that forms a flexible, seamless waterproofing membrane.
    - a. Exceeds ANSI A118.10 and A118.12.
    - b. Contains antimicrobial product protection.
- E. Leveling and Patching Compounds: Latex types as recommended by flooring manufacturer.

## **PART 3 - EXECUTION**

### **3.1 TILE INSTALLATION STANDARDS**

- A. ANSI Tile Installation Standard: Comply with applicable parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for installation of ceramic tile.
- B. TCNA Installation Guidelines: TCNA "Handbook for Ceramic Tile Installation (latest edition)"; comply with TCNA installation methods indicated or, if not otherwise indicated, as applicable to installation conditions shown.
- C. Comply with manufacturer's instructions for mixing and installation of proprietary materials.

### **3.2 INSTALLATION**

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
  - 1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
    - a. Tile floors in wet areas.
    - b. Tile floors consisting of tiles 8 by 8 inches (200 by 200 mm) or larger.
    - c. Tile floors consisting of rib-backed tiles.
- B. Surface Preparation:
  - 1. All surfaces should be between 40°F (4°C) and 90°F (32°C) and structurally sound, clean and free of all dirt, oil, grease, paint, concrete sealers or curing compounds.
  - 2. Rough or uneven concrete surfaces should be made smooth with a latex fortified underlayment or leveling mortar to provide a proper finish.
  - 3. Dry, dusty concrete slabs or masonry should be dampened and excess water swept off.
  - 4. Installation may be made on a damp surface.
  - 5. New concrete slabs shall be damp cured and 28 days old before application.
  - 6. All slabs must be plumb and true to within 1/4" (6 mm) in 10 ft (3 m).
  - 7. Expansion joints shall be provided through the tile work from all construction or expansion joints in the substrate. Follow ANSI specification A108.01-3.7 "Requirements For Movement Joints: Preparations by Other Trades" or TCNA detail EJ-171 "Movement Joints—Vertical & Horizontal". Do not cover expansion joints with mortar.

- C. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.
- E. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- F. Set marble thresholds in same type of setting bed as field tile, unless otherwise indicated.
- G. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.
- H. 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.
- I. Grout tile to comply with the referenced standards, using grout material as indicated.
  - 1. Where pregrouted sheets are used, field-grout perimeter of individual sheets with same elastomeric material as used in factory pregrouted sheets.
- J. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
  - 1. Quarry Tile: 1/4 inch (6.4 mm).

### **3.3 FLOOR INSTALLATION METHODS**

- A. Quarry Tile: Install tile to comply with requirements indicated below for setting bed method, TCNA installation method related to type of subfloor construction, and grout type and in accordance with applicable ANSI installation specifications:
  - 1. Concrete Subfloor, Interior, slab on grade or above-ground: TCNA F112 (bonded).
    - a. Mortar: Latex portland cement; ANSI A118.4 or better or ISO C2 or better.
    - b. Grout: Epoxy; ANSI A118.3 or ISO RG.
  - 2. Elevated concrete slabs or where indicated: TCNA F122A, thin set, with membrane.
    - a. Mortar: Latex portland cement; ANSI A118.4 or better or ISO C2S1 or better unless ANSI A118.1 or ISO C1 is recommended by membrane manufacturer. Must also be recommended by manufacturer for above-ground use.
    - b. Grout: Epoxy; ANSI A118.3 or ISO RG.
    - c. Waterproof Membrane: ANSI A108.13 or manufacturer's directions. Comply with plumbing and building codes.

### **3.4 WALL TILE INSTALLATION METHODS**

- A. Install type of tile designated for wall / base application to comply with requirements indicated below for setting bed methods, TCNA installation methods related to subsurface wall conditions, and grout types and in accordance with applicable ANSI installation specifications:
  - 1. Masonry or Concrete, Interior: TCNA W202I.
    - a. Mortar: Latex portland cement; ANSI 118.4 or better or ISO C2 or better.
    - b. Grout: Latex portland cement; ANSI 118.6 or better or ISO CG1 or better.
  - 2. Gypsum Board, Interior: TCNA W242.
    - a. Organic Adhesive; ANSI 136.1 (Type I or II) or ISO D1 or better.
    - b. Grout: Latex portland cement; ANSI 118.6 or better or ISO CG1 or better.

### **3.5 CLEANING AND PROTECTION**

- A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
- B. Remove temporary wax coating from quarry tile, using methods recommended by manufacturers of tile and grout.
  - 1. Apply tile and grout sealer in compliance with sealer manufacturer's directions. Repeat application as necessary to obtain uniform color in appearance of both tile and grout.
- C. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.
- D. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage and wear.
  - 1. Prohibit foot and wheel traffic from using tiled floors for at least 7 days after grouting is completed.
  - 2. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

**END OF SECTION 09300**

## SECTION 09510 - ACOUSTICAL CEILINGS

### 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 acoustical ceiling is shown and scheduled on the drawings.
- B. Types of acoustical ceilings specified in this section include the following lay in acoustical ceiling board, exposed suspension system.

#### 1.3 QUALITY ASSURANCE

- A. Installer: Firm with a recommended three years of successful experience in installation of acoustical ceilings similar to requirements for this project and which is acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer.
- B. Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- C. Surface Burning Characteristics: As follows, tested per ASTM E 84.
  - a. Flame Spread: 25 or less.
  - b. Smoke Developed: 50 or less.
- D. All acoustical ceilings shall be installed to conform to the requirements of International Building Code for Category C and the recommendation of the Ceiling and Interior Systems Construction Association (CISCA) for Zone 2 seismic design and comply with installation requirements for areas subject to light to moderate seismic activity.
- E. General Contractor shall provide adequate ventilation and humidity control before, during and after ceiling installation to prevent damage (sagging, etc.) to ceilings prior to Owner's acceptance of building.
- F. Warranty:
  - 1. Provide manufacturer's special project warranty against sagging or warping of acoustic ceiling boards for a minimum period of **thirty (30) years** which starts on approved date of substantial completion.
- G. Unless otherwise approved by the Architect, all Acoustical Ceiling Board types and Suspended Grid System types shall be by a single manufacturer.

## 1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required including certified test reports to show compliance with requirements of these specifications.
  - 1. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.
- B. Samples: Submit manufacturer's standard size samples of acoustical units, but not less than 6" square, and of exposed ceiling suspension members including wall and special moldings. Provide samples showing full range of colors, textures and patterns available for each type of component required.
- C. Shop Drawings: Submit shop drawings for acoustical ceilings, including layout of system components and details of connections between elements of system and between system and other building components.
  - 1. **Contractor must provide shop drawings certifying that attachment devices meet specified loads. Contractor must coordinate with all other Prime Contractors / Subcontractors for fixture loads, etc.**
- D. Testing Reports: Submit testing reports which indicate compliance with indicated requirements.
- E. Deliver extra materials to Owner. Furnish extra materials described below matching products installed, packaged with protective covering for storage and identified with appropriate labels.
  - 1. Acoustical Ceiling Units: Furnish quantity of full size units equal to 2.0% (rounded up to the nearest full carton) of each type of acoustic unit installed.
  - 2. Exposed Suspension System Components: Furnish quantity of each exposed component equal to 2.0% (rounded up to the nearest full carton) of each type suspension component installed.

## 1.5 PROJECT CONDITIONS

- A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Provide Acoustical Ceiling Board (ACB and AACB) and Metal Suspension System as manufactured by Armstrong World Industries; United States Gypsum Co.; CertainTeed Ceilings; 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. Comparable products of the following manufacturers will be considered if it can be clearly shown that their products are equal to or will exceed the construction quality requirements and other design attributes listed as performance of the "Basis of Design" Systems.
    - a. Armstrong World Industries,
    - b. USG Corporation,
    - c. CertainTeed Ceilings.
    - d. Rockfon, LLC,
    - e. Or approved equal.
  2. 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.
- C. Substitute products will be considered for substitution only when submitted to the Architect as per the requirements of AIA A201 and Section 00800.

## **2.2 ACOUSTICAL CEILING BOARDS**

- A. Refer to reflected ceiling plans for sizes and locations.
- B. Where ACB-1 is indicated: 24" x 48" x 3/4" thick, reveal edge, NRC .70; CAC 35, light reflectance 90%, sag resistance; Humiguard Plus Performance. Armstrong Ultima (Item# 1914); USG Mars ClimaPlus (Item #88785); CertainTeed Symphony m 75 (Item # 1220BB-75-1); or approved equal.
- C. Where AACB is indicated: 24" x 24" x 5/8" thick, square edge, NRC.55; CAC 40; Class 25; Sag Resistance; Humiguard Max Performance, mineral fiber composition with ceramic binders. Armstrong Fine Fissured Ceramaguard (Item# 607) white finish; USG Mars Healthcare Acoustical Panels (Item# 88270), or approved equal.

## **2.3 METAL SUSPENSION SYSTEMS, GENERAL**

- A. Standard for Metal Suspension Systems: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable ASTM C 635 requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory-applied finish for type of system indicated. For exposed suspension members and accessories with painted finish, provide color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's full range of standard colors.
- C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.

- D. Concrete Inserts: Inserts formed from hot-dipped galvanized sheet steel and designed for attachment to concrete forms and for embedment in concrete, with holes or loops for attachment at hanger wires.
- E. Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at 3-times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gage (0.106").
- F. Type of System: Either direct-hung or indirect-hung suspension system, at Contractor's option.
  - 1. Carrying Channels: 1-1/2 inch steel channels, hot-rolled or cold-rolled, not less than 0.475 lbs. per lineal foot.
- G. Edge Moldings and Trim: Metal types and profiles indicated or, if not indicated, provide manufacturer's standard molding for edges and penetrations of ceiling which fits with type of edge detail and suspension system indicated. Provide 7/8" edge at wall angle and reveal edges.
- H. Hold-Down Clips: For interior ceilings composed of lay-in panels weighing less than 1 lb. per sq. ft., or where indicated, provide hold-down clips spaced 2'-0" o.c. on all cross tees.

## **2.5 EXPOSED METAL SUSPENSION SYSTEMS**

- A. Double Web Steel Suspension System: For use where ACB ceilings are indicated. Manufacturer's standard system roll-formed from prefinished hot dipped galvanized steel with 15/16" wide exposed faces on flanges of structural members; other characteristics as follows:
  - 1. Structural Classification: Intermediate-Duty System.
  - 2. Finish: Painted in color as selected by Architect.
  - 3. Basis of Design: Armstrong World Industries "Prelude XL Exposed Tee System"; USG "Donn Brand DX", CertainTeed 15/16" Classic Stab; or approved equal.
- B. Double Web Suspension System: For use where AACB ceilings are indicated. Manufacturer's standard system fabricated from roll-formed prefinished hot dipped galvanized steel with 15/16" wide exposed faces of aluminum cap on flanges of structural members cap and other characteristics as follows:
  - 1. Structural Classification: Intermediate-Duty System.
  - 2. Finish: Painted, in colors as selected from manufacturer's full line of colors. Provide white color unless indicated otherwise.
  - 3. Basis of Design: Armstrong World Industries "Prelude Plus XL Fire Guard"; USG "Donn Brand DXA/DXLA", CertainTeed 15/16" FireSecure; or approved equal.

## **2.6 MISCELLANEOUS MATERIALS**

- A. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Examine conditions under which acoustical ceiling work is to be performed and notify Architect in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner.

### **3.2 PREPARATION**

- A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.
- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

### **3.3 INSTALLATION**

- A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and CISCA standards applicable to work.
- B. Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.
  - 1. Install tile with pattern running in one direction, unless otherwise indicated.
- C. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers not less than 6" from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".
  - 1. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.
- D. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
  - 1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
  - 2. Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.
  - 3. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

4. Install hold-down clips in areas indicated, and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.
- E. Cooperate with other trades and Contracts for installation of their materials and equipment, particularly with those installing the ductwork, ceiling diffusers and lighting fixtures so that diffusers, lighting fixtures and other items are located on center lines of tile or on centers of joints as shown on approved shop drawings.
1. Provide additional hanger wires to support cubicle curtain tracks, and other superimposed loads. Locate the supplemental hangers within 6 inches of each corner of the item being supported.
  2. Where light fixtures, or other recessed items occur in ceilings, frame acoustical material properly to permit installation of such recessed items and do all necessary cutting and fitting of acoustical materials and suspension systems to accommodate same. Cut neatly around all pipes passing through ceilings. Build in fixture frames and yokes in cooperation with Electrical Contractor.

### **3.4 CLEANING**

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage. General Contractor is responsible for cleaning or replacement of all damaged tile, regardless of how the damage was caused and regardless of by which Contractor.

**END OF SECTION 09510**

## **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 and risers.
  - 4. 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 07900 - Joint Sealer Assemblies.
- E. Section 09685 - Carpet Tile.

#### **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/cm<sup>2</sup> 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/cm<sup>2</sup> 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 flooring and accessory.
- B. Samples for Verification Purposes: Submit the following samples in triplicate of each type, color, and pattern of resilient flooring required, 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 replacement materials from same manufactured lot as materials installed, and as follows:
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. 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.
- E. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- F. Leveling and Patching Compounds: Latex types as recommended by flooring manufacturer.
- G. Slip Retardant Polish: Provide slip-retardant polish as recommended by resilient tile manufacturer.
  - 1. POLISH FOR RESILIENT FLOORING
    - a. Floor Polish: Contractor shall provide floor polish to achieve the Static Coefficient of Friction; per ASTM D 2047, of 0.5 or better for level surfaces and as per requirements of state and local codes having jurisdictions.

## 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 borders, 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 resilient flooring 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.

### **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 09685 - CARPET TILE

### 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 03450 - Self Drying Finishing Underlayment
  - 4. Section 09650 - Resilient Flooring for rubber base.

#### 1.2 SUMMARY

- A. Extent, location and details of type of carpeting are indicated on the drawings.
- B. Work of this section includes furnishing and installation of carpeting, adhesives and accessories.

#### 1.3 DEFINITIONS

- A. Commercial Carpet: Carpet 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 Association of Textile Chemists and Colorists (AATCC):
  - 1. ATTCC 134: Test Method for Electrostatic Propensity of Carpets.
  - 2. AATCC 174: Antimicrobial Activity Assessment of Carpets.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM E 648: Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
  - 2. ASTM E 662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Comply with the following general performance requirements:
  - 1. Radiant Panel: ASTM E-648: Class 1
  - 2. Smoke Density: ASTM E-662  $\leq 450$
  - 3. Static: AATCC - 134,  $\leq 3.5$  KV
  - 4. Indoor Air Quality: CRI Green Label Plus

B. Comply with the following special performance requirements:

1. Carpet must be square, 4 hole cross-section.
2. Carpet must be Eco Solution Q® SDNylon.
3. Carpet must have permanent anti-static fiber.
4. Carpet must have Soil Protection.
5. Carpet must be 100% Solution Dyed.
6. Carpet must have Non-Woven Synthetic Primary and EcoWorx® Tile Backing.
7. Carpet meets ADA Compliance.

C. Warranty Performance Requirements:

1. Manufacturer shall issue a **Lifetime Commercial Limited** warranty from the date of Substantial Completion.
2. **Special Project Warranty:**
  - a. 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.
3. Refer to Section 01900 "Warrantees and Guarantees".

## 1.6 SUBMITTALS

A. Manufacturer's Data: Submit manufacturer's product literature and installation instructions for each 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 an installation instructions.

B. Fiber Requirements: Submit certification from the fiber producer verifying the following:

1. Use of the specified fiber in the submitted carpet product.
2. Must have federally registered Branded trademark.

C. Certificate of Compliance:

1. Submit certified test reports that carpet meets all the performance requirements stated above in paragraph 1.4 (above) Performance requirements. Submit certified test reports that carpet meets all performance criteria.



D. Samples:

1. Submit two carpet samples 6" x 8" of each type, color, and pattern of carpet materials required. Submit two samples, 6" in lengths of edge guard stripping.
2. Any alternates to specified products must be submitted for approval by the Architect.
3. Final Sample Submittal:
  - a. Submit two (2) sets of samples for each carpet type.
  - b. No carpet shipments are permitted until acceptance of final samples is given by the Architect / Owner.
  - c. Samples submitted are assumed to be the manufacturer's best obtainable match to the carpet described under Materials Section.

E. 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.

F. 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 each type of carpeting.

G. 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.

H. 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.

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 types, trowel sizes, spread rates, open times, and Safety Data Sheets (SDS) for all modular adhesives.
3. Warranties and Performance Certifications:
  - a. Submit written warranties for all products as well as Performance testing results on all items included in Warranty section and Performance section of this specification.

## **1.7 QUALITY ASSURANCE**

- A. Single Source Responsibility: Provide products from a single manufacturer.
- B. Warranties must be manufacturer's standard and not job specific.
- C. All styles must come from the same manufacturer.
- D. Do not install carpet until areas have been fully enclosed and environmental conditions have reached the levels indicated during occupancy.
- E. Maintain ambient temperature and humidity conditions during and after installation of carpet at levels indicated during occupancy.
- F. Allow carpet to reach room temperature or minimum temperature recommended by manufacturer before beginning installation.
- G. Protect adhesives from freezing. Follow manufacturer's recommendations for minimum temperatures to which adhesives are exposed.
- H. IAQ Requirements, Green Label: All products must be CRI Green Label Certified.
- I. Carpet must be 100% recyclable.

## **1.8 QUALIFICATIONS**

- A. Manufacturer:
  1. Company specializing in manufacturing Commercial Carpet with a recommended minimum five (5) years of documented experience and has been in continuous operation and using technology that has been in use for a recommended ten (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 / Construction Manager with written documentation of locations within the project that were supervised by the manufacturer.

- b. Manufacturer shall notify the Architect / Construction Manager and the General Construction Work Contractor if installation instructions are not completely followed.
3. The manufacturer must agree to provide a Reclamation Program. Written documentation, indicating that this program is in effect with proof that the mechanics of the program is available at the time of the bid.

B. Installer:

1. Company specializing in installing carpet 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 carpet 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.

C. Indoor Air Quality Testing:

1. Submit testing reports furnished by an independent testing laboratory with manufacturers' certification attesting that all carpet supplied for this project have been tested and passed the Indoor Air Quality Testing requirements established by the Carpet and Rug Institute (CRI), Green Label Program for VOC's, which do not exceed the established emission levels. Likewise, the adhesives to be used for installation of the carpet have been tested and determined to be in compliance with the CRI Indoor Air Quality Testing Program requirements.

## **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. Provide “**Color Pop**” as manufactured by Patcraft; or approved equal.

1. Type: Multi-Level Pattern Loop.
2. Face Yarn: Eco Solution Q® Nylon
3. Color System: 100% Solution Dyed.
4. Yarn Weight: 16.0 ounces per square yard.
5. Average Density: 5,818 ounces per cubic yard
6. Primary Backing: Non-Woven Synthetic
7. Secondary Backing: EcoWorx ® Tile
8. Pile thickness: 0.099".
9. Total thickness: 0.224".
10. Stitches: 10.3/in.
11. Size: 24 in x 24 in.
12. Soil/Stain Protection: SSP® Shaw Soil Protection.
13. Preservative Protection: When used with Shaw 5036 adhesive
14. Environmental Specifications:
  - a. Total Recycled Content 45%
  - b. Recycled Content (Pre-Consumer) 45%
  - c. Recycled Content (Post Consumer) 0%
  - d. Other Environmental Claims: MBDC Cradle to Cradle - Silver Certified  
NSF 140 - Gold Certified  
CRI Green Label Plus - Certified glp9968  
USGBC LEED - Contributes  
Building Research Establishment - Certified
15. Traffic Classification: Heavy (TARR).

B. Provide “**Linea 2**” as manufactured by Patcraft; or approved equal.

1. Type: Pattern Loop.
2. Face Yarn: Eco Solution Q® Nylon
3. Color System: 100% Solution Dyed.
4. Yarn Weight: 16.0 ounces per square yard.
5. Average Density: 5,818 ounces per cubic yard
6. Primary Backing: Non-Woven Synthetic
7. Secondary Backing: EcoWorx ® Tile
8. Pile thickness: 0.099".
9. Total thickness: 0.250".
10. Stitches: 10.0/in.
11. Size: 24 in x 24 in.
12. Soil/Stain Protection: SSP® Shaw Soil Protection.
13. Preservative Protection: When used with Shaw 5036 adhesive
14. Environmental Specifications:
  - a. Total Recycled Content 45%
  - b. Recycled Content (Pre-Consumer) 45%
  - c. Recycled Content (Post Consumer) 0%
  - d. Other Environmental Claims: MBDC Cradle to Cradle - Silver Certified  
NSF 140 - Gold Certified

15. Traffic Classification: Heavy (TARR).

- C. Patterns and Colors: Patterns as directed by the Architect; allow for as many colors and patterns including borders and accent colors and shall be as per Architect's direction. A maximum of three (3) patterns and five (5) colors shall be used in this project and a maximum of two (2) patterns and three (3) colors shall be used in any given area.
- D. Comparable products of 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.
  - 1. Approved equal by Interface FLOR.
  - 2. Approved equal by Bentley.
  - 3. Approved equal by Bigelow.
  - 4. Approved equal by Prince Street.
  - 5. Approved equal by Mannington.
  - 6. Or approved equal.

## 2.2 ACCESSORIES

- A. Floor Primer: Manufacturer's approved floor primer applied to all areas that will receive carpeting.
- B. Carpet Edge Guard, Non-metallic: Extruded or molded heavy-duty vinyl or rubber carpet edge guard of size and profile indicated; minimum 2" wide anchorage flange; colors selected by Architect from standard colors.
- C. Installation Adhesive: Water-resistant, non-staining as recommended by carpet manufacturer, which complies with flammability requirements for installed carpet.
- D. Miscellaneous Materials: As recommended by manufacturers of carpet, cushions, and other carpeting products; selected by Installer to meet project circumstances and requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine and test substrates for moisture content, high alkalinity, levelness and other conditions under which carpeting 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.
  - 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. Coordinate with installation of floor leveling underlayment where indicated or required.

### **3.2 PREPARATION**

- A. Repair minor holes, cracks, depressions, and rough areas using material recommended by carpet or adhesive manufacturer.
- B. Clear away debris and scrape up cementitious deposits from surfaces to receive carpeting; vacuum clean immediately before installation. Check concrete surfaces to ensure no dusting through installed carpet; apply sealer where required to prevent dusting.

### **3.3 GENERAL**

- A. Install work in strict conformance with manufacturer's printed recommendations and as shown on approved seaming layouts.
- B. Substrates shall be free from dust, oils, grease or other foreign matter. Cracks, holes and unevenness shall be filled with latex base floor filler.
- C. During winter conditions, building shall be preheated to 72°F for at least 24 hours prior to installation. During summer conditions, air conditioning shall be in operation or other provisions shall be made to obtain temperatures and humidity within limits recommended by the manufacturer.
  1. Temperatures shall be kept constant night and day during installation.
  2. Concrete shall have cured for at least sixty (60) days prior to installation.

### **3.4 CARPET TILE**

- A. Butt Fitting and Joints: Brush pile back and tip individual tiles into place to avoid catching pile in the joint.
  1. Frequently check joints for proper alignment and firm abutment.
  2. Avoid excessively tight joints which will cause tile to peak or buckle.
  3. Check tightness and establishing gain factor.
  4. Cut tile from the back and secure cuts or partial tiles with manufacturer's standard or approved releasable compatible adhesive or double sided tape.
  5. Install all carpet tile with pile orientation in the proper direction, as recommended by the manufacturer for each carpet type, follow manufacturer's embossed arrows on the back of tiles as guide for the proper direction.
    - a. If carpet product will be installed in parquet pattern only, arrows should point in the same direction every other tile and diagonally.
  6. Center floor trench headers directly under a full tile row.
  7. Install tile rows adjacent to walls as per manufacturer's recommended instructions.

8. In open perimeter designs, use a fixed reducer and carpet keeper strips to secure the tile area. Use types and sizes recommended by the tile carpet manufacturer.
9. Remove and replace damaged tiles, protect carpet tile until inspection for substantial completion of carpet tile work.
10. Install every tile with releasable adhesive in accordance with manufacturer's instructions and information for using of appropriate tools and methods of applications.

### **3.5 CLEANING**

- A. Remove and dispose of debris and unusable scraps. Vacuum carpet using commercial machine with face-beater element. Remove spots and replace carpet where spots cannot be removed. Remove any protruding face yarn using sharp scissors.

### **3.6 CALL BACK**

- A. Prior to expiration of **two (2) year warranty**, perform all necessary corrections and adjustments.

### **3.7 ADDITIONAL MATERIAL**

- A. Deliver to Owner as directed not less than five percent (5%) additional carpet tile of each type, pattern and color used.

**END OF SECTION 09685**

## **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 01030 - Alternate Bids.
  - 2. Section 04200 - Unit Masonry.
  - 3. Section 05120 - Structural Steel.
  - 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 schedule, 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, aluminum 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, pipe spaces, and duct 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. 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.
- D. 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.
- E. Lead and Chromate Contents: All paint products must be free of any lead or chromate contents.
- F. 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).
- G. 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.
- 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 (6) 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.

## **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. 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 DTM Acrylic.
  - 3. 3rd Coat: Acrylic Enamel, Sherwin-Williams, Pro Industrial DTM Acrylic.
  - 4. Apply to following interior surfaces: Exposed metal ductwork.
  - 5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

C. 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.

D. 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.

E. Egg-Shell - Dryfall Acrylic Latex:

1. 1st Coat: Galvanized steel or ferrous metal primer to suit substrate.
2. 2nd Coat: Sherwin Williams, Low VOC Waterborne Acrylic Eg-Shel Dryfall Flat, B42-80 Series.
3. 3rd Coat: Sherwin Williams, Low VOC Waterborne Acrylic Eg-Shel Dryfall Flat, B42-80 Series.
4. Apply to following interior surfaces: Overhead exposed structural steel, underside of steel deck, etc.
5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

- F. Concrete Floor Sealer: Clear Acrylic Waterborne Concrete Sealer; (Non-slip coating for concrete floor sealer finish):
1. 1st Coat: Floor-Tex; Seal Krete Inc., as distributed by Sherwin-Williams or approved equal.
  2. 2nd Coat: Floor-Tex; Seal Krete Inc., as distributed by Sherwin-Williams or approved equal.
  3. Apply to concrete floors where concrete sealer is indicated on finish schedule.
  4. 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 10100 - DRY MARKERBOARDS**

### **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 dry markerboards is indicated on the drawings.
- B. Type of dry markerboards specified in this section includes the following:
  - 1. Porcelain enamel steel dry marker boards.
  - 2. Factory applied trim.
  - 3. Field applied trim.

#### **1.3 REFERENCES**

- A. ASTM E84 Standard Test Method for Surface Burning Characteristics for Building Materials.
- B. ASTM C540 Gloss for ceramic materials.
- C. ASTM C614 for alkali resistance.
- D. ASTM D2244 evaluation of color differences.
- E. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wires, Profiles and Tubes.
- F. ASTM C208-72 for cellulosic fiberboard.
- G. ANSI A208.1-79 for particleboard.
- H. ANSI H35.1-82 for aluminum temper and alloy.
- I. HNSI A424-80 for steel for porcelain enameling.
- J. FS LLL-B-810 for tempered hardboard.
- K. PEI-1002 Manual and Performance Specification for Porcelain Enamel Writing Surfaces.
- L. BYK-Gardner Surface Distortion.
- M. GREENGUARD Indoor Air Quality Certified.
- N. GREENGUARD Children and Schools Indoor Air Quality Certified.

## 1.4 QUALITY ASSURANCE

- A. Manufacturer: Furnish all dry markerboards by a single manufacturer for the entire project.
- B. Uniformity of color, corrosion, temperature, alkali, water, range of gloss test, uniform texture, light reflectance and cleanability are requirements for all groups and have specific ranges for each.
- C. Product Certifications: Provide GREENGUARD Indoor Air Quality Certified and GREENGUARD Children and Schools Indoor Air Quality Certificates for markerboards.
- D. Reflectivity of LCSII ceramicsteel Markerboard writing surfaces shall not exceed the following:
  - 1. Gloss Range / 60° Gloss meter GU (Gloss Units)
    - a. LCSII ceramicsteel for Markerboard 68 -76% (low gloss surface).
    - b. LCSII ceramicsteel for writing surfaces - Surface Distortion reduction and the optimum improvement to performance characteristics.
  - 2. Contrast/waviness for Markerboards (light and dark effects) shall be no greater than 15 [Scale 0 - 30] when tested with BYK - Gardner Wave Scan 5+ Measuring device showing visual acuity (contrast sensitivity) to the human eye at distances greater than 3 meters (10'- 0").
  - 3. Resolution (visual acuity) shall be based on 3 lines per degree and be visibly maintained beyond the current standard of 3 meters. [Byk-Gardner Wave Scan 5+ Measuring device].
  - 4. Surface distortion ("orange peel"/surface peaks and valleys) as tested by the BYK-Gardner Wave Scan 5+ Measuring device [Scale 0 - 60]. Values are established by the difference in the highpoint/low point of the Markerboard test surfaces. P 3 ceramicsteel shall establish the lowest range of distortion from 11.7 - 16.02.

## 1.5 SUBMITTALS

- A. Samples and colors for each:
  - 1. Face sheet materials
  - 2. Cork materials
  - 3. Vinyl materials
  - 4. Aluminum trim or wood trim types and profiles.
- B. Shop Drawings: Submit shop drawings for each type of drymarker. Include sections of typical trim members and dimensioned elevations. Show anchors, grounds, reinforcement, accessories, layout and installation details.
  - 1. Drawings shall indicate location and actual material lengths of each unit. Room elevations shall indicate joint locations and include dimension from floor and adjacent side walls, cross-sections for trim, backing, face and core materials, fastener spacing and types of units provided.

- C. Product Data: Submit manufacturer's technical data and installation instructions for each material and component part, including data substantiating that materials comply with requirements.
- D. Certification: Submit the manufacturer's certification that materials furnished for the project comply with the specified requirements.
- E. Manufacturer's Product Warranty: Submit manufacturer's product and accessories warranty and certificate of authenticity from manufacturer.
- F. Product use, regular cleaning, stain removal and precautions information in the operation and maintenance instructions.

#### **1.6 SPECIAL PRODUCT WARRANTY**

- A. Submit a "**Life of Building**" warranty, stating that under normal usage and maintenance, and when installed in accordance with manufacturer's instructions and recommendations, porcelain enamel steel markerboard writing surfaces are guaranteed for the Life of the Building. Guarantee covers replacement of defective boards, but does not include cost of removal or reinstallation.
- B. Writing Surface Warranty Period: **Lifetime of the building** commencing on the Date of Substantial Completion.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Basis of Design: "Series 1", as manufactured by Claridge Products and Equipment, Inc., Tel.# 800.434.4610; or approved equal.
  - 1. Finishes and Colors: Shall be selected by the Architect from manufacturer's available full range of finishes and colors including painted aluminum colors.
- B. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
  - 1. Manufacturers of Porcelain Enamel Dry Markerboards:
    - a. Educational Equipment.
    - b. Platinum Visual Systems
    - c. Or approved equal

#### **2.2 MARKERBOARD MATERIALS**

- A. Porcelain Enamel: Provide balanced, high pressure laminated porcelain enamel markerboards of 3-ply construction consisting of facing sheet, core material and backing.
  - 1. Face Sheet: LCS-II Porcelain Enamel grade cold rolled steel for markerboard, as indicated on drawings..

- a. Coat the exposed face with a 3-coat process consisting of primer, ground coat and color cover coat, and the concealed face with a 2-coat process consisting of primer and ground coat.
    - 1) Bottom Ground Coat - 1.5 to 2.2 mils
    - 2) Top Ground Coat - 2.0 to 2.8 mils
    - 3) Top Cover (Color) Coat - 3.0 to 4.0 mils
  - b. Fuse cover and ground coats to the steel at the manufacturer's firing temperatures, but not less than 1,200 deg.F (649°C).
  - c. LCS-II Porcelain Enamel for markerboard with improved writing and erasing surface (3 colors low gloss and 3 colors high gloss)
  - d. Facing sheet construction:
    - 1) 1.7-2.5 mils enameled ground coat on face minimum thickness.
    - 2) 3.0 - 4.0 mils enameled cover (color) coat for markerboard.
    - 3) 1.7-2.5 mils enameled minimum ground coat on back of facing.
    - 4) Firing temperatures shall be a minimum of 1200°F for LCSII markerboard.
2. Writing Surface Core: 7/16" Medium Density Fiberboard (MDF) composed of approximately 90% post-industrial waste.
    - a. Units over 12'-0" in length and longer will require H-bar at center.
  3. Moisture backer shall be factory laminated to core material. A 0.005" thick aluminum backer shall be provided standard on all markerboards.
  4. Perimeter trim shall be as indicated on the architectural drawings.
  5. Factory Built Trim: Markerboard tray shall be 2-3/4" with 3/4" radius corners and include box tray.
  6. Maprail: shall be provided on all markerboards and will be either 1" or 2", as indicated on the architectural drawings/details.
    - a. Cork insert to be Claridge Cork, color as selected by Architect.
  7. Accessories (1" or 2"):
    - a. Maphooks (minimum two per 4' maprail).
    - b. Flag holder (one per room).
      - 1) Provide separate wall mount flagholder, as required. Coordinate locations with locations of projection screens.
    - c. Map roller brackets (one pair per markerboard).
    - d. Maprail end stops (one pair per display rail).

8. Lamination:
  - a. Factory machine type only.
  - b. Specially formulated adhesives.

### **2.3 FABRICATION**

- A. Assembly: Provide factory assembled dry markerboard units, except where field assembled units are required.
- B. Make joints only where the total length exceeds the maximum manufactured length. Fabricate with the minimum number of joints, balanced around the center of the board, as acceptable to the Architect.
  1. Provide the manufacturer's standard vertical joint system between abutting sections of dry markerboard.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Field Measurements: Take field measurements prior to the preparation of shop drawings and fabrication where possible, to ensure proper fitting of the work. Allow for trimming and fitting wherever taking of field measurements before fabrication might delay work.
- B. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

### **3.2 INSTALLATION**

- A. Deliver factory-built dry markerboard units completely assembled in one piece without joints, wherever possible. Where dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to the Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site. Use splines at joints to maintain surface alignment.
- B. Install units in locations and at mounting heights indicated and in accordance with the manufacturer's instructions. Keep perimeter lines straight, plumb and level. Provide all grounds, clips, backing materials, adhesives, brackets, anchors, trim and accessories necessary for a complete installation.
  1. Anchor all components securely using tamperproof fasteners, where accessible.
  2. Install all dry markerboards with completely concealed continuous hangers.
  3. Where wall mount flagholders is required install units where directed by the Architect / Owner.
- C. Provide factory-trained installers.

- D. Apply manufacturers' adhesive behind each board using roughly ¼ cup @ 16" on center.
- E. Mounting height from the floor for each room shall be as follows:
  - 1. Consult with the Architect / Owner before start of installation: 36"
- F. Clean boards using manufacturers' recommended procedures and install cleaning labels for each room.
- G. Locate accessories on each board as specified.
- H. Provide mitered and wrapped hairline joints for all trims.
- I. Provide fasteners at perimeter trims 16" – 24" and 12" – 16" on trays.

### **3.3 ADJUST AND CLEAN**

- A. Verify that accessories required for each unit have been properly installed and that operating units function properly.
- B. Clean units in accordance with the manufacturer's instructions. Break-in markerboards only as recommended by the manufacturer.
- C. Repair or replace all damaged units and surfaces to the approval of the Architect at no additional cost to Owner.

**END OF SECTION 10100**



## **SECTION 10161 - SOLID PLASTIC TOILET COMPARTMENTS**

### **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 minimum Class "C", fire-rated solid toilet compartments is indicated on the drawings.
- B. Style of toilet compartments includes: Floor-anchored, overhead braced.
- C. Style of screens include: Wall-hung.
- D. Related Work:
  - 1. Section 10800 - Toilet Accessories.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required. Submit 4" square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.
- D. Test Reports: Submit manufacturer's reports of testing of rigid plastic products indicating compliance with indicated performance requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances where ever taking of field measurements before fabrication might delay work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.
- C. 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 5 years.

- D. Installer's Qualifications: A company regularly engaged in installation of products specified in this section, with a recommended minimum of 5 years of experience.
- E. **Code Compliance: Privacy partitions (including toilet partitions) shall be tested in accord and comply with NFPA 286 Room-Corner Test.**
- F. Interior Wall and Ceiling Finish Materials in accordance with IBC, Section 8031.1. shall be classified in accordance with ASTM E84 or UL 723. Interior finishes shall be grouped in the following classes:
- |    |           |                    |        |
|----|-----------|--------------------|--------|
| 1. | Class A = | Flame spread index | 0-25   |
|    |           | Smoke developed    | 0-450  |
|    | Class B = | Flame spread index | 26-75  |
|    |           | Smoke developed    | 0-450  |
|    | Class C = | Flame spread index | 76-200 |
|    |           | Smoke developed    | 0-450  |

**Exception:** "Room corner test for interior wall or ceiling finish materials"

- a. Interior wall or ceiling finish materials shall be permitted to be tested in accordance with NFPA 286 and shall comply with IBC Section 803.1.2.1.
2. In accordance with IBC 803.9 - High-density polyethylene (HDPE) and polypropylene (PP), when the material is used as an interior finish, it shall comply with IBC Section 803.1.2.
- G. 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.

## 1.5 WARRANTY

- A. Manufacturer's Warranties: Provide manufacturer's standard **twenty-five (25) year** warranty for all solid plastic compartments, products and all other assemblies.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Provide products as manufactured by Scranton Products, Scranton, PA, Tel.# 800.445.5148, [www.scrantonproducts.com](http://www.scrantonproducts.com), or approved equal, from their full line of standard textures and colors.
1. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
- Metpar Corp., Westbury, NY, Tel.# 516.333.2600, [www.metpar.com](http://www.metpar.com).
  - ASI Global Partitions, Eastanollee, GA, Tel.# 706.827.2700, [www.globalpartitions.com](http://www.globalpartitions.com).

- c. Bradley, Menomonee Falls, WI, Tel.# 800.272.3539, [www.bradleycorp.com](http://www.bradleycorp.com).
- d. Or approved equal.

**2.2 MATERIALS**

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Solid Plastic: One piece seamless, one inch thick solid HDPE plastic with a homogenous color throughout fabricated from polymer resins.
- C. **Interior Wall and Ceiling Requirements by Occupancy** for flame spread index per (IBC, Table 803.11):

GROUP	SPRINKLERED			NONSPRINKLERED		
	Interior exit stairways, ramps & passageways	Corridors & enclosure for exit access stairways and ramps	Rooms & enclosed spaces <sup>c</sup>	Interior exit stairways, ramps & passageways <sup>a, b</sup>	Corridors & enclosure for exit access stairways and ramps	Rooms & enclosed spaces <sup>c</sup>
A-1, A-2	B	B	C	A	A <sup>d</sup>	B <sup>e</sup>
A-3 <sup>f</sup> , A-4, A-5	B	B	C	A	A <sup>d</sup>	C
B, E, M	B	C	C	A	B	C

Notes:

- a. Class C interior finish materials shall be permitted for wainscotting or paneling of not more than 1,000 sf of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.13.1.
- b. In other than Group I-3 occupancies in buildings less than three stories above grade plane, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.
- c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms or spaces on both sides shall be considered one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the Group classification of the building or structure.
- d. Lobby areas in Group A-1, A-2 and A-3 shall not be less than Class B materials.
- e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.

- f. For places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.

### **2.3 FABRICATION**

- A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Overhead-Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous extruded aluminum anti-grip overhead-bracing at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
- C. Wall-Hung Screen: Furnish panel units in sizes indicated, of same construction and finish as partition system panels.
- D. Minimum requirements for partitions are as follows:
  - 1. Doors: 1-inch thick equipped with gravity type hinges and push-pull hardware. Provide out-swinging, over-sized doors at water closet compartments for handicapped users.
  - 2. Pilasters: Adjustable, 1 inch thick; provide overhead headrail bracket.
  - 3. Fasteners: Stainless steel 1/4 inch tamper proof shoulder screws and barrel nuts.
  - 4. #14 Screw: Stainless steel #14 x 1-1/2 inch screw used along with plastic anchors for attachments to floor and building walls.
  - 5. End Cap: Aluminum cap fastened to the ends of headrail bracing.
  - 6. Headrail Bracket: 16 gauge stainless steel used to connect headrail bracing.
  - 7. Door Pull: Heavy duty Zamac chrome-plated used on out-swinging doors only. Provide on inside and outside of door.
  - 8. Latch: Anodized aluminum with bright-dip finish. Specially black hard coat slide bolt for extra long wear.
  - 9. Strike: Heavy-duty aluminum extrusion with bright-dip anodized finish: rubber door stop.
  - 10. Bumper/Coat Hook: Heavy Zamac chrome-plated with rubber bumper. All doors are furnished with hook. Bumper functions as a stop on in-swinging doors. Mounting height to be 48" above finish floor.
  - 11. Door Stop: Zamac chrome-plated used on out-swinging doors only as a stop.
  - 12. The Architect selects brackets, hinges and shoes as follows:

- a. Wall Brackets shall be 1½" stirrup type made of heavy-duty aluminum (6463-T5 alloy) with a bright dip anodized finish. Stirrup brackets shall be fastened to pilasters and panels with stainless steel tamper resistant torx head sex bolts.
  - b. Hinges: Manufacturer's Stealth™ integral hinge system. Pilaster to be machined to accept door, and chrome plated Stealth™ integral hinge mechanism anchored to the door and pilaster. Door closures to be factory set to accommodate all conditions and allow for a positive opening and closing action free of impediment.
  - b. Shoes: 20 gauge stainless steel construction to secure the pilaster to the floor.
13. Provide manufacturer's special hardware and accessories to accommodate all loads and conditions of partitions and screens.

## **2.4 COLORS AND FINISHES**

- A. Selection from manufacturer's full line of standard fire-rated colors and finishes. Allow for two colors per room, with a total of four colors.
  1. Stainless steel items shall have a polished finish.
  2. Aluminum items shall have a natural color anodized finish.
  3. Chrome plated items shall have a polished finish.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Comply with manufacturer's recommended procedures and installation sequence. Install partitions rigid, straight, plumb, and level. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in masonry or tile joints. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- B. Overhead-Braced Partitions: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.
- C. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.

### **3.2 ADJUST AND CLEAN**

- A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.

- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

**END OF SECTION 10161**

## **SECTION 10200 – LOUVERS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes: Fixed, drainable extruded-aluminum louvers.
- B. Related Sections:
  - 1. Section 07900 – Joint Sealer Assemblies.
  - 2. Section 13341 – Metal Building System.

#### **1.2 PERFORMANCE REQUIREMENTS**

- A. Design: Design louvers, including comprehensive engineering analysis by a qualified engineer, using structural performance requirements and design criteria indicated.
- B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors.
  - 1. Wind Loads: Determine loads based on a uniform pressure of 30 lb./sq. ft. (1435 Pa), acting inward or outward.
- C. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
  - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
- C. Samples: For each type of metal finish required.
- D. Submittal: For louvers indicated to comply with structural performance requirements and design criteria indicated.
- E. Product Test Reports: Based on tests performed according to AMCA 500-L

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Aluminum Extrusions: ASTM B 221M, Alloy 6063-T5.
- B. Aluminum Sheet: ASTM B 209M, Alloy 3003 with temper as required for forming.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
  - 1. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.

### **2.2 FABRICATION, GENERAL**

- A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- B. Join frame members to each other and to fixed louver blades with fillet welds concealed from view welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.
- C. Provide vertical mullions of type and at spacing indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
  - 1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.
  - 2. Provide extended sill for recessed louvers.
- D. Provide adjustable sill extensions for proper water drainage.

### **2.3 FIXED, WIND-DRIVEN-RAIN DRAINABLE EXTRUDED-ALUMINUM LOUVERS**

- A. Horizontal High Performance Drainable Blade Louver.
  - 1. Basis-of-Design Product: American Warming and Ventilating; Model# LE-44; or approved equal.
  - 2. Subject to compliance with requirements, provide the specified product or comparable product by one of the following:
    - a. Manufacturers of equivalent products submitted and approved in accordance with AIA A201 and Section 00800.
  - 2. Louver Depth: 4 inches



3. Blade Profile: Drainable wind-driven-rain blade with front gutter for water diversion to jambs
4. Frame Nominal Thickness: Not less than .081 Inch.
5. Blades Nominal Thickness: Not less than .060 Inch.
6. Louver Performance Ratings:
  - a. Free Area: Not less than 8.01 sq.ft. for 48-inch wide by 48-inch high louver.
  - b. Point of Beginning Water Penetration: Not less than .01 oz. at 1079 fpm.
  - c. Air Performance: Not more than 0.41-inch wg static pressure drop at 1079 fpm free-area velocity.
  - d. Wind Driven Rain Water Penetration Effectiveness Rating: Class A 99.0%
  - e. Core Ventilation Rate: 402 fpm at 29 mph with 3in rain per hour rainfall rate
  - f. Free Area Ventilation Rate: 551 fpm
7. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## **2.4 LOUVER SCREENS**

- A. General: Provide screen at each exterior louver.
- B. Louver Screen Frames: Same kind and form of metal as indicated for louver to which screens are attached.
- C. Louver Screening: Same kind of metal as indicated for louver.
  1. Bird Screen: 0.5 inch .051 Expanded Aluminum.

## **2.5 ALUMINUM FINISHES**

- A. Kynar Standard Color with Prime finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufactures' written instructions.
  1. Color and Gloss: As selected by Architect from manufacturer's full range.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weather-tight connection.

- C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- D. Repair damaged finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory and refinish entire unit or provide new units.
- E. Protect galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint.

**END OF SECTION 10200**

## **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. Cast metal plaques.
  - 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 rubbings for metal plaques.

## **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 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.
- C. Fasteners: Unless otherwise indicated, used concealed fasteners fabricated from metals that are non-corrosive to either the sign material or the mounting surface.
- D. 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) Types "7 & 9" Signs - Classrooms and Offices:

a) Provide 1/4" thick non-combustible, self extinguishing solid composite plastic sign signs with integral tactile letters, numbers and symbols raised a minimum of 1/32" from sign face. Provide window insert with non-glare clear plastic cover.

b) Basis of Design: Provide "Series 200A Sand Carved process with window insert Series 400 Vinyl Copy" as manufactured by Mohawk Sign Systems Inc., or approved equal, by Brandon Signage Co., Tel.# 717.582.5161.

##### 2) Type "8" Signs - Multi-Purpose Room, Stage, Cafeteria, Auditorium, 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.

##### 3) Informational Signage:

a) Provide informational plastic signs at selected doors, as shown on drawings and schedules.

##### i) Signs - "THIS IS NOT AN EXIT", "EXIT", etc.:

(1) 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.

4) Sizes: As indicated or as directed by the Architect / Owner.

5) 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. Accessible parking signs, directional signs to accessible entrances, barrier-free traffic control signs 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 CAST METAL PLAQUES**

- A. Provide a rectangular 2'-8" x 1'-10" plaque with raised letter copy. Raised letter copy shall be as directed by the Architect / Owner.
- B. Fabricate cast metal plaques to comply with requirements specified for metal, border style, background texture and finish and to comply with requirements shown for thickness, size, shape and copy.
- C. Produce castings free from pits, scale, sand holes or other defects.
- D. Hand tool and buff borders and raised copy to produce the manufacturer's standard satin polished finish.
  1. Metal: Aluminum casting.
  2. Border Style: None (straight), polished edge.
  3. Background Texture: Manufacturer's standard pebble texture.
  4. Background Finish: Provide dark statuary finish to comply with the requirement specified for aluminum finishes, or as selected by the Architect from manufacturer's available finishes.

## **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.
  2. Cast Metal Plaques: Mount cast plaques using the standard method recommended by the plaque manufacturer for the type of wall surface indicated.
    - a. Concealed Mounting: Mount the plaques by inserting threaded studs into tapped lugs on the back of the plaque. Set in predrilled holes filled with quick-setting cement.

### **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**

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## SECTION 10522 - FIRE EXTINGUISHERS, CABINETS, AND 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 DESCRIPTION OF WORK

- A. Extent of fire extinguishers, cabinets and accessories is indicated on the drawings.
- B. Definition: "Fire Extinguishers" as used in this section refers to units which can be hand-carried as opposed to those which are equipped with wheels or to fixed fire extinguishing systems.
- C. Type of products required include:
  - 1. Fire extinguishers.
  - 2. Mounting brackets.
  - 3. Signs.

#### 1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain products in this section from one manufacturer.
- B. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

#### 1.4 SUBMITTALS

- A. Product Data: Submit product data for each type of product included in this section.

#### 1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
    - b. Faulty operation of valves or release levers.
  - 2. Warranty Period: **Six (6) years** from date of Substantial Completion.

## **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. J.L. Industries.
  - 2. Larsen's Mfg. Co.
  - 3. Potter Roemer
  - 4. Or approved equal.

### **2.2 FIRE EXTINGUISHERS**

- A. General: Provide fire extinguishers for locations indicated, in colors selected by Architect from manufacturer's standard which comply with requirements of governing authorities.
- B. Fill and service extinguishers to comply with requirements of governing authorities and manufacturer's requirements.

### **2.3 MOUNTING BRACKETS**

- A. Provide manufacturer's standard brackets designed to prevent accidental dislodgement of extinguisher, of sizes required for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.
- B. Provide brackets for extinguishers

### **2.4 SIGNAGE**

- A. Identification: Signage complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
  - 1. Basis of Design: "PTD-182", V-Shaped Sign - 'FIRE EXTINGUISHER' with picture of extinguisher on red background; or approved equal.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
- B. Securely fasten mounting brackets to structure, square and plumb, to comply with manufacturer's instructions.
- C. Where exact location of bracket-mounted fire extinguishers is not indicated, locate as directed by Architect.

### **3.2 IDENTIFICATION**

- A. Identify bracket-mounted extinguishers with red letter decals spelling "FIRE EXTINGUISHER" applied to wall surface. Letter size, style and location as selected by Architect.

**END OF SECTION 10522**

## **SECTION 10605 - WIRE MESH PARTITIONS**

### **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 standard-duty wire mesh partitions.

#### **1.3 DEFINITIONS**

- A. The types of weaves for the wire mesh specified in this Section are as illustrated and defined in ASTM E 437 and its Appendix X4.2:
  - 1. Plain Weave: Wires pass over one and under the next adjacent wire in both directions.
  - 2. Lock Crimped: Deep crimps at points of intersection to lock the wires securely in place.
  - 3. Intercripmed: Similar to plain weave with extra crimps between the intersections.

#### **1.4 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
  - 1. Product Data for each type of product specified, consisting of manufacturer's specification, technical data, and installation instructions.
  - 2. Shop Drawings showing fabrication and installation of wire mesh partitions, including plans, elevations, and large-scale details showing anchorage and accessory items. Provide location template drawings for items supported or anchored to permanent construction.
  - 3. Samples of a 12-by-12-inch (300-by-300-mm) wire mesh panel constructed of specified frame members, wire mesh, and color charts.

#### **1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Engage a firm experienced in manufacturing wire mesh partitions similar to those indicated for this Project and that have a record of successful in-service performance.

#### **1.6 PROJECT CONDITIONS**

- A. Field Measurements: Check actual locations for wire mesh products by accurate field measurements before fabrication and show recorded measurements on Shop Drawings.

Coordinate fabrication and delivery schedules with construction progress to avoid delaying the Work.

- B. Where field measurements cannot be made without delaying the Work, guarantee location dimensions and proceed with fabricating wire mesh products without field measurements. Coordinate wall, column, floor, and ceiling construction to ensure that actual location dimensions correspond to guaranteed dimensions.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Acorn Wire and Iron Works, Inc.
  - 2. G-S Company (The).
  - 3. Hoosier Fence Co., Inc. (The).
  - 4. Indiana Wire Products, Inc.
  - 5. Kentucky Metal Products Co.
  - 6. King Wire Partitions, Inc.
  - 7. Lakeside Wire and Iron Co.
  - 8. Miller Wire Works, Inc.
  - 9. SpaceGuard Products.
  - 10. Wire and Iron Products, Inc.
  - 11. Or approved equal.

### **2.2 MATERIALS**

- A. Steel Wire: ASTM A 853.
- B. Steel Channels, Angles, Plates, and Bars: ASTM A 36 (ASTM A 36M).
- C. Steel Sheet: ASTM A 568 (ASTM A 568M).
- D. Cold-Rolled Steel Channels: Formed from steel sheet.
- E. Square Steel Tubing: Cold-formed structural steel tubing, ASTM A 500.
- F. Galvanized Steel Wire: ASTM A 641 (ASTM A 641M).
- G. Galvanized Steel Sheet: Commercial-quality, hot-dip-coated steel sheet, ASTM A 653, with G60 or A60 (ASTM A 653M, with Z180 or ZF180) coating.

### **2.3 STANDARD-DUTY MESH PARTITIONS**

- A. Mesh: 0.135-inch- (3.4-mm-) diameter, intercrimped steel wire woven into 1-1/2-inch (38-mm) diamond mesh, securely clinched to frame members.

- B. Frames: Provide cutouts for pipes, ducts, beams, and other items shown or necessary for partition installation. Finish edges of cutouts to provide a neat, protective edge.
- C. Vertical Members: 1-1/4-by-5/8-by-0.1046-inch (32-by-16-by-2.7-mm) cold-rolled steel C-Section channels with 1/4-inch- (6-mm-) diameter bolt holes approximately 18 inches (450 mm) o.c.
- D. Horizontal Members: 1-by-1/2-by-1/8-inch (25-by-13-by-3-mm) cold-rolled steel channels, mortised and tenoned to vertical members.
- E. Horizontal Reinforcing Members: 1-by-1/2-by-1/8-inch (25-by-13-by-3-mm) cold-rolled steel channels with wire woven through or two 1-by-1/2-inch (25-by-13-mm) steel channels bolted or riveted toe to toe through mesh, and secured to vertical members. Provide number of horizontal reinforcing members to suit panel height as recommended by partition manufacturer.
- F. Vertical Stiffening Bars: For freestanding partitions 12 feet (3.66 m) in height or over, provide flat steel bar stiffener posts between abutting panel frames. Size as recommended by partition manufacturer for partition height required. Increase size of stiffening bars, if required, to maintain partition rigidity.
- G. Top Capping Bars: 2-1/4-by-1-inch (56-by-25-mm) cold-rolled steel channels, secured to top framing channels with 1/4-inch- (6-mm-) diameter "U" bolts spaced not more than 28 inches (700 mm) o.c.
- H. Line Posts: Where partition runs exceed 20 feet (6 m) without intersecting or connecting to overhead framing, furnish 3-inch (75-mm) by 4.1-lb (1.9-kg) steel channel line posts with 5-by-18-by-1/4-inch (125-by-450-by-6-mm) steel base plates located at recommended intervals to ensure partition rigidity and stability.
- I. For other than 90-degree intersections, use manufacturer's recommended tubular steel corner posts and installation accessories.
- J. Floor Shoes: Cast metal, sized to suit vertical framing and to provide approximately 3 inches (75 mm) of clear space between finished floor and bottom horizontal frame members. Furnish units with set screws for leveling adjustment.
- K. Sheet Metal Base: Panels of 0.0598-inch- (1.5-mm-) thick steel sheets, welded or bolted to frames.

## **2.4 DOORS**

- A. Hinged Door: Door frame of 1-1/4-by-1/2-by-1/8-inch (32-by-13-by-3-mm) steel channels with 1-1/4-by-1/8-inch (32-by-3-mm) flat steel bar cover plates on 3 sides, and 1/8-inch- (3-mm-) thick angle strike bar and cover on lock side. Provide 1-1/2 pair of 3-by-3-inch (75-by-75-mm) butt hinges riveted or welded to door and frame, and mortise-type cylinder lock operated by key outside with recessed knob inside. Align bottom of door with bottom of adjacent panels.
- B. Provide manufacturer's standard cylinders for lock.

## **2.5 FABRICATION**

- A. Do not use components less than sizes indicated. Use larger-size components as recommended by partition component manufacturer.
- B. Provide bolts, hardware, and accessories for complete installation.
- C. Finish: Manufacturer's standard, shop-applied enamel finish. Provide manufacturer's standard finish color.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

### **3.2 INSTALLATION**

- A. Erect partitions plumb, rigid, properly aligned, and securely fastened in place, complying with Drawings and manufacturer's recommendations.
- B. Provide additional field bracing as shown or necessary for rigid, secure installation. Installer to provide additional clips and bracing as required.

### **3.3 ADJUSTING AND CLEANING**

- A. Adjust moving components for smooth operation without binding.
- B. Touch up damaged finish after completing installation using field-applied paint to match color of shop-applied finish.

**END OF SECTION 10605**

## **SECTION 10670 - METAL SHELVING**

### **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 work included is shown on the drawings.
  - 1. Maintenance Work Area shelving.

#### **1.3 QUALITY ASSURANCE**

- A. Uniformity: Provide type of metal shelving as produced by a single manufacturer, including necessary mounting accessories, fittings and fastenings.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and installation instructions.
- B. Samples: Submit color samples for Architect's selection.
- C. Shop Drawings: Submit shop drawings verifying dimensions affecting installations. Show in detail, method of installation and accessories.

#### **1.5 JOB CONDITIONS**

- A. Protect from damage during delivery, handling, storage and installation.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Basis of Design: Clip shelving as manufactured by Republic Storage Products, LLC, Uniontown, OH, Tel.# 800.477.1255; or approved equal.
- B. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
  - 1. Provide "Clipper Conventional Flange Shelving" as manufactured by Penco Products Inc., or approved equal.
    - a. Capacity: Provide metal shelving which shall meet or exceed the Basis of Design indicated load capacity Class.



## **2.2 SHELVING**

### **A. Shelving System:**

1. Single angle end posts, double angle intermediate posts, 7'-1" high.
2. Number and sizes as shown, 36 inches wide, 18 gauge, with reinforcing bar, front and rear (Class 2B). For shelves 18 inches deep and deeper, provide Class 3 shelves.
3. Include sway braces at rear and at end uprights. Include also a label holder for each shelf.
4. Baked enamel finish, colors as selected by Architect from manufacturer's available full range of standard and optional colors.
5. Provide metal bracket, lead anchor and screws for fastening shelving units to wall. Provide anchors for each shelving unit.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install metal shelving at the locations shown on the drawings and in accordance with manufacturer's instructions for plumb, level, rigid, and flush installation.
- B. Anchor shelving to walls and floors.

### **3.2 ADJUST AND CLEAN**

- A. Touch up marred finishes, but replace units which cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by shelving manufacturer.

## **END OF SECTION 10670**

## **SECTION 10731 - CANOPY**

### **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 PRODUCT**

- A. Wall mounted hanging rod canopy system.

#### **1.3 REFERENCES**

- A. Reference Standards:
  - 1. AAMA -Voluntary specification 2605-98
  - 2. ASTM - B209, A653, A792, A36
  - 3. AMS - QQ-A-250/2
  - 4. AWS - American Welding Society.

#### **1.4 SUBMITTALS**

- A. Submit approval drawings and calc books, both signed and sealed by a Professional Engineer licensed in the state where the project is located.
- B. Product Design Requirements: The canopy shall meet the following design requirements, as shown on the drawings:
  - 1. Building Code: See drawings.
  - 2. Ground Snow Load (Pg): See drawings.
  - 3. Basic Wind Speed (V): See drawings.
  - 4. Seismic Design: See drawings.
- C. Submittal Requirements: Calculations and Submittal drawings shall include, at a minimum:
  - 1. Calculations:
    - a. References to building codes and design manuals used for calculations.
    - b. Formulas used for determining snow, wind, and seismic loads to specific project location.
    - c. Connection design for anchorage to the building.
  - 2. Submittal Drawings shall specify and indicate:
    - a. All materials and finishes to be applied.
    - b. Canopy framing.
    - c. Panel lay-out.
    - d. Hanging rod diameter and clevis size.
    - e. Upper wall brackets.
    - f. Methods of anchorage, including structural connection details showing bolt sizes and plate thicknesses.

## 1.5 QUALITY ASSURANCE

### A. Manufacturer Qualifications:

1. Company specializing in engineering and manufacturing pre-engineered canopies with a recommended minimum experience of ten (10) years.

## 1.6 MANUFACTURER WARRANTY

- A. Canopy framing must have a **ten (10) year** limited warranty on paint finish.
- B. Canopy roof panels from pre-finished coil stock must have a **twenty (20) year** limited warranty on paint finish.

## PART 2 – PRODUCTS

### 2.1 CANOPY SYSTEM AND MATERIALS

#### A. Manufacturers:

1. Basis of Design: “Marquee Classic Canopy” as manufactured by Floline Architectural Systems, LLC, Plainfield, IL; Tel.# 866.356.5463; [www.flolinesystems.com](http://www.flolinesystems.com); or approved equal.
2. Subject to compliance with the specification sections contained herein, other manufacturer’s which may provide canopies include the following:
  - a. MASA Architectural Canopies, Avenel, NJ 07001, Tel.# 800.761.7446, [www.architecturalcanopies.com](http://www.architecturalcanopies.com).
  - b. Mapes Architectural Canopies, Lincoln, NE 68514, Tel.# 888.273.1132, [www.mapescanopies.com](http://www.mapescanopies.com).
  - c. Architectural Fabrications, Fort Worth, TX 76104, Tel.# 817.926.7270 [www.arch-fab.com](http://www.arch-fab.com).
  - d. Or approved equal.

#### B. Product Requirements and Materials:

1. General: The canopy (frame and roof panels) shall be shop assembled. Upper wall brackets, hanging rod assemblies, and mounting hardware will ship “loose” for final field assembly. Field labor will be kept to a minimum by pre-manufactured parts.
2. Canopy Framing: Custom formed shapes fabricated and factory welded from aluminum plate conforming to AMS QQ-A-250/2 – ASTM B209. Frame shall have a 70% Kynar finish conforming to AAMA 2605-98. Color chosen by Architect from manufacturer's standard color chart. Mechanical connections of framing utilizing rivets are not acceptable.
3. Wall Connection Requirements:

- a. Structural fasteners thru canopy frame shall be 300 series alloy stainless steel bolts/anchors.
  - b. Structural fasteners thru upper wall brackets shall be hot dipped galvanized A307 bolts.
  - c. Hanging rod assemblies shall be 300 series alloy stainless steel.
  - d. All exposed fasteners shall be painted by manufacturer prior to shipment to match the canopy color.
4. Sheet Metal:
- a. Roof Panels shall be "Floline - 940 profile": 1-1/2 inch (38 mm) deep with ribs spaced 7.2 inches (183 mm) on center; nominal cover width of 36 inches (914 mm); sidelap occurs at top of high ribs.
    - 1) Substrate and material thickness:
      - a) Aluminum in 0.040" thickness
    - 2) Paint finish: Kynar 500® paint on topside, standard off-white primer on backside. Color chosen from manufacturer's standard color chart.
      - a) Sheet metal components:
        - (1) Provide accessories and other items essential to completeness of canopy installation as shown on drawings or as required by the manufacturer.
        - (2) Form components from same gauge and finish as metal panels, unless otherwise noted.
5. Finishes:
- a. Kynar 500® Finish on Aluminum Canopy Framing:
    - 1) Spray-applied 70% Kynar finish meeting the AAMA Voluntary Specification 2605-98 shall be met.
    - 2) Total dry film thickness shall be 1.2 mil (typ), but not less than 1.0 mil.
    - 3) Sample production parts shall have been tested and meet the following criteria:
      - a) Salt spray resistance per ASTM B 117 to 4,000 hours minimum rating of 7 on scribe line or cut edges.
      - b) Color retention per ASTM D 2244, Section 6.3 – maximum 5.0 E units (Hunter) color change after minimum 10-yr exposure test per Section 7.9.1.1.
      - c) Chalk resistance No. 8 rating for colors and No. 6 rating for whites per ASTM D 4214, Test method A (Method D 659) for ten (10) years per Section 7.9.1.1.
      - d) Gloss Retention per ASTM D 523 shall be a minimum of 50% after 10-yr exposure test per Section 7.9.1.1.
    - 4) Exposed fasteners for frame and ornamentation shall be painted to match the canopy.
  - b. Kynar 500® Finish on Sheet Metal:
    - 1) Full Strength Kynar 500®/Hylar 5000 (contains a minimum 70% Kynar/Hylar polyvinylidene fluoride (PVDF) resins) premium fluoropolymer coating system of 1.0 (± 0.1) mil total dry film thickness. For additional protection a wash coat of 0.3 -0.4 mil dry film thickness is applied to the reverse side.

## **PART 3 – EXECUTION**

### **3.1 INSTALLERS STORAGE AND HANDLING**

- A. Inspect delivered materials upon receipt to insure no damage has occurred during shipment.
- B. Protect canopy after arrival at destination from weather, sunlight, and damage.
- C. Installer shall store canopy elevated from soils to allow air circulation and to not introduce mold, fungi decay or insects to the product.
- D. Product must be handled with protective straps or padded forks if lifting with mechanical equipment. Use of chain or cable to lift product into place will not be accepted.

### **3.2 ERECTION**

- A. Install canopy according to manufacturer's installation instructions, approved shop drawings, and these specifications.
- B. Remove any strippable film at time of installation.
- C. The General Contractor shall be responsible for protecting the canopy from construction operations and abuse by other trades.

### **3.3 REPAIR**

- A. Do not attempt any field changes without first contacting the manufacturer.

### **3.4 CLEANING**

- A. Prevent rust staining by immediately removing from finished surfaces any filings caused by drilling or cutting.
- B. All dirt oil, grease, fingerprints, or other contaminants shall be removed after installation is completed.
- C. Follow manufacturer's recommended cleaning and maintenance instructions.

**END OF SECTION 10731**

## SECTION 10800 - TOILET AND BATH 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 DESCRIPTION OF WORK

- A. Extent of each type of toilet accessory is indicated on the drawings and schedules.
- B. Type of toilet accessories required includes but are not limited to the following:
  - 1. Mirrors
  - 2. Grab bars
  - 3. Soap dispensers
  - 4. Towel dispensers
  - 5. Toilet tissue dispensers
  - 6. Napkin disposals
  - 7. Mop and broom holder/utility shelf

#### 1.3 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.
- C. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable to Architect.

#### 1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.
- B. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices and cut-out requirements in other work.

#### 1.5 WARRANTY

- A. Washroom Accessories: Warranty is limited to replacing or repairing, at the manufacturer's option, transportation charges prepaid by the purchaser, any washroom accessory unit or part thereof which their inspection shall show to have been defective within the limitation of the warranty. Period of warranty is measured from the date of their invoice as follows:
  - 1. Complete unit (except mirrors) - **One (1) year**.
  - 2. Stainless Steel Mirror Frames - **Fifteen (15) years** - against corrosion.

3. Tempered Glass Mirrors - **Five (5) years** - against silver spoilage.
4. Polished #8 Architectural Grade Finish on 304 Series Stainless Steel - **One (1) year** against corrosion.
5. Bright Annealed Finish on 430 Series Stainless Steel - **One (1) year** against corrosion.

Note: Warranty does not cover installation labor charges and does not apply to any units which have been damaged by accident, abuse, improper installation, improper maintenance, or altered in any way.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Basis of Design: Catalog numbers used herein are Bradley Washroom Accessories, or approved equal. Refer to drawings for schedule and additional information. Similar products for other indicated manufacturers will be acceptable.
- B. Subject to compliance with requirements, manufacturers offering toilet accessories which may be incorporated in the work include one of the following:
  1. American Specialties, Inc.
  2. Bobrick Washroom Equipment, Inc.
  3. Or approved equal

### **2.2 MATERIALS, GENERAL**

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge (.034") minimum, unless otherwise indicated.
- B. Brass: Leaded and unleaded, flat products, FS QQ-B-613; Rods, shapes, forgings, and flat products with finished edges, FS QQ-B-626.
- C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gauge (.040") minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- F. Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.
- G. Mirror Glass: ASTM C-1048, Type I, Class 1, Quality q2, 1/4" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411. Provide tempered safety glass for all mirrors.
- H. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- I. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

## 2.3 PRODUCT DESCRIPTIONS

- A. Mirror Units: #780 Series, Mirror plates shall be of No. 1 quality 1/4" polished safety glass, silvered and electrolytically copper backed.
1. Frames shall be 3/4" x 3/4", type 304, 18 gauge satin finish stainless steel angle with mitered corners, welded and polished smooth, with 20 gauge angle stiffeners welded to frame, 20 gauge galvanized steel back with formed edges secured to frame with concealed screws and equipped with integral 18 gauge cold rolled steel all welded construction wall hangers.
  2. Mirror units shall guaranteed by the manufacturer for a period of **fifteen (15) years** which starts on approved date of installation.
  3. Sizes as indicated on drawings and schedules.
- B. Grab Bars: ( Provide quantity and types indicated)
1. Stainless Steel Type: Provide grab bars with wall thickness not less than 18 (.050") gauge and as follows:
    - a. Mounting: Concealed, manufacturer's standard flanges and anchorages.
    - b. Clearance: 1-1/2" clearance between wall surface and inside face of bar.
    - c. Gripping Surfaces: Manufacturer's non-slip texture.
    - d. Heavy-Duty Size: Outside diameter of 1-1/2".
- C. Soap Dispensers: (Provide one at each lavatory)
1. No. HIL22281, as manufactured by Hillyard, Inc., surface-mounted , high capacity 1,250 mL soap refill containers. Fully ADA compliant. Dispenser size: 6.25" w x 1-.75" h x 3.75" d.
- D. Towel Dispensers: (Provide quantity as indicated, minimum one each toilet room)
1. No. PAP306489, as manufactured by Hillyard, Inc., surface mounted standard hand towel roll dispenser, push-bar auto transfer system is a high capacity dispenser and holds a 8 inch diameter hard wound roll towel, black translucent cover constructed of high impact / flame retardant, chemical-resistant, rigid vinyl plastic. ADA Compliant. Dispenser size: 10-1/2" w x 15-3/4" h x 8-3/4" d.
- E. Toilet Tissue Dispensers: (Provide one at each water closet and as indicated).
1. No. PAP306389, as manufactured by Hillyard, Inc., surface-mounted, single jumbo bath tissue roll dispenser, holds a 9 inch bath tissue roll refill; black translucent cover with builtin pilferage control; made of high impact plastic and design helps prevent damage; ADA compliant. Dispenser size: 10-1/8" w x 12" h x 5-3/4" d.
- F. Napkin Disposals: Surface mounted, Model 4722-15, one toilet compartment, fabricated of type 304, 22 gauge stainless steel with exposed surfaces in satin finish. Self-closing push flap door and stainless steel removable receptacle with tumbler lock. Overall dimensions - 10-3/4" w x 15- 1/8" h x 4" d.



## **2.4 MISCELLANEOUS ACCESSORIES**

- A. Mop and Broom Holder: No. 9953, Type 304 stainless steel-wall mounted unit with three (3) spring-loaded rubber cam type mop/broom holders, 24" long.

## **2.5 FABRICATION**

- A. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either the interior surface of the accessory or on the back surface, the manufacturer shall indicate the manufacturer's information, model number on a printed waterproof label or a stamped nameplate attached to the accessory.
- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Examine the areas and conditions under which work is to be installed and notify the Architect in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

### **3.2 INSTALLATION**

- A. Install toilet accessory units in accordance with manufacturers' instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Use all metal type fasteners such as anchors, plates, screws, bolts and expansion shields, type as required by the construction to which accessories are to be secured. Exposed hardware shall match finish of the accessory.

### **3.3 ADJUSTING AND CLEANING**

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces after removing temporary labels and protective coatings.

## **END OF SECTION 10800**

## **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. High-Security Key Box.

#### **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 and include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.

### **PART 2 - PRODUCTS**

#### **2.1 HIGH-SECURITY KEY BOX**

- A. Basis of Design: Provide "Knox-Box® - Series 3200", recessed, high-security key box as manufactured by Knox Co., Pheonix, AZ, Tel.# 800.552.5669, [www.knoxbox.com](http://www.knoxbox.com); or approved equal.
  - 1. Color: As selected by Architect from manufacturer's standard colors / finishes.
- B. Subject to compliance with requirements, manufacturers offering products and accessories which may be incorporated in the work include the following:
  - 1. TRAC-Vault" as manufactured by Supra a United Technologies Co.
  - 2. Or approved equal.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Demonstrate proper operation of the equipment to Architect's satisfaction. Adjust as required for smooth, efficient operation.
- B. Provide instructions for Owner's personnel, with manufacturer's use and maintenance manuals.

- C. Protect equipment from damage until acceptance of the entire project by the Owner.
- D. Install equipment and materials in accordance with manufacturer's recommendations and instructions for installation.

**END OF SECTION 10900**

## SECTION 11000 - GENERAL REQUIREMENTS - CASEWORK AND EQUIPMENT WORK

### 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. Casework and Equipment Work includes all items listed on schedules. All general requirements of this section apply to all equipment Contracts.

#### 1.3 QUALITY ASSURANCE

- A. Products of individual manufacturers are scheduled to establish type and standard of quality. Products of other manufacturers proposed to be used shall meet the published specifications of the specified product as to materials, finishes, design and fabrication, to the satisfaction of the Architect.
- B. Compatibility: Provide each type of equipment by a single manufacturer, including accessories. It is of the utmost importance that a stability of design and interchangeability of parts and pieces be provided, and it shall be specifically understood that a miscellaneous assortment of equipment assembled by dealers or agents will not be considered as meeting requirements of the specification.
- C. Casework and/or Equipment Work specified herein and other Division 11 specification sections have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.
  - 1. Comparable products of other manufacturers will be considered only if it can be clearly shown that their products are equal to or will exceed the construction quality requirements and other design attributes listed by manufacturers for indicated model numbers.
  - 2. The General Contractor will not award subcontract for Casework or Equipment supplier unless the Architect has approved that supplier's samples, certificates, individual product drawings, and proof of ability to perform.

#### 1.4 SUBMITTALS

- A. Submit manufacturer's technical data, catalog cuts and installation instructions for each type of furniture and equipment.
- B. Samples: Submit, for verification purposes, samples of each exposed material from which equipment units and accessories are composed, in each color, finish, pattern and texture indicated. If these qualities are not indicated, submit, for initial selection, manufacturer's color charts or samples of actual materials showing full range of standard colors, finishes, patterns, and textures available. Include samples of the following:

1. Plastic laminate
  2. Baked enamel finishes for metal components
  3. Wood and plywood materials and finishes
  4. Molded plastic and fiberglass
  5. Exposed fasteners
- C. Submit full-size samples of finished units when complete with hardware, doors, adjustable shelves, etc., when requested by Architect. Acceptable sample units will be used for comparison inspection at project. Unless otherwise directed, acceptable sample units may be incorporated in the work. Notify Architect of their exact locations. If not incorporated in the work, retain acceptable sample units in the building until completion and acceptance of the work. Remove sample units from the premises when directed by Architect.
- D. Shop Drawings
1. Submit shop drawings showing plans, elevations, ends cross-sections. Show details and location of anchorages and fitting to floors, walls and base. Include layout of units with relation to surrounding walls, doors, windows, and other building components.
  2. Coordinate shop drawings with other work involved.

## **1.5 PRODUCT HANDLING**

- A. Deliver casework only after wet operations in building are complete.
- B. Store completed equipment in ventilated place, protected from the weather, with relative humidity therein of 50% or less at 70°F.
- C. Protect sanded and finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective coating.

## **1.6 JOB CONDITIONS**

- A. Advise Architect of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content.
- B. Examination of Substrate and Conditions
  1. Field measurements shall be taken to verify that the equipment will fit into the designated space. Entry ways, corridors and door openings shall be verified to ensure that the equipment be manufactured in a matter to permit it to be moved through properly into place.
  2. Examine the substrate and the conditions under which the work under this section is to be performed, including condition of substrate to which equipment is to be attached, and notify the Architect, in writing, of unsatisfactory conditions. Do not proceed with work under this section until satisfactory conditions have been corrected in an acceptable manner.

## 1.7 QUALIFICATION OF SUPPLIERS OF CASEWORK AND EQUIPMENT

- A. That it owns and operates a factory or factories adequate for and devoted to the manufacture of casework, equipment or material which is proposed to furnish and maintains strict inspection and quality control over the various manufacturing operations performed to produce a satisfactory end product of the standard and quality set forth in the detailed specification.
  - 1. That is at the time of submitting products and equipment and had been engaged in the manufacturing of casework or equipment for a recommended 10 consecutive years and has maintained during this time a published catalog of such specialized equipment, including a line similar to the specified.
  - 2. That the manufacturer or his franchised representative shall have a major installation of equipment delivered and installed over a recommended 10 years conforming to the design and quality specified herein.

## 1.8 VARIATION FROM MATERIALS, PRODUCTS AND EQUIPMENT SPECIFIED

- A. The designs, materials, finishes, and functions have been selected by the Owner on the advise of the Architect with intention of creating an integrated building design. For this reason, no variations from the plans, specifications and design guide will be permitted except as noted below.
  - 1. Whenever and wherever in any of the contract documents an article, material or equipment is defined by describing a proprietary product or by using the statement, "as manufactured by", it is the intent that this shall describe by reference the materials desired; craftsmanship and method of manufacture, as well as the size and dimensions rather than detailing all of these requirements herein. It is not the intention to limit the bidding on such items, but merely to indicate that the item must conform to these standards.
  - 2. **Any Laboratory Casework manufacturer requesting equivalence must submit test report from a Scientific Equipment and Furniture Association (SEFA) approved independent testing facility showing compliance with SEFA-8 standards. Failure to provide the required information maybe cause for rejection.**

## PART 2 - PRODUCTS

2.1 See Schedules on Drawings.

### 2.2 GENERAL REQUIREMENTS (As applicable for each Contract)

- A. BASIS OF DESIGN: CATALOG NUMBERS REFER TO CAMPBELL-RHEA CASEWORK CATALOG, ETC.; OR APPROVED EQUAL, UNLESS OTHERWISE SHOWN, SEE PARAGRAPH 1.2 ABOVE.
- B. ALL CASEWORK DOORS AND DRAWERS TO HAVE LOCKS KEYED ALIKE PER ROOM AND MASTER KEYED.
  - 1. The Contractor shall package keys for each room separately and identify the room number on the package and deliver to the Owner's Representative.

- C. ALL TOPS SHALL BE 1-1/2" PLYWOOD WITH PLASTIC LAMINATE COVERING ON ALL EXPOSED SURFACES (UNLESS NOTED OTHERWISE).
- D. ALL BACKSPLASHES SHALL BE 3/4" PLYWOOD WITH PLASTIC LAMINATE COVERING ON ALL EXPOSED SURFACES (UNLESS NOTED OTHERWISE).
- E. ALL FURNITURE, CASEWORK AND EQUIPMENT SHOWN DOTTED AND/OR IS INDICATED AS (N.I.C.) IS NOT IN CONTRACT.
- F. UNLESS OTHERWISE SHOWN, THE CASEWORK AND EQUIPMENT WORK SUBCONTRACTOR SHALL SUPPLY AND DELIVER ALL SINKS, TAILPIECES, FAUCETS, AND STRAINERS, IN CASEWORK TO THE PLUMBING AND DRAINAGE WORK (SUB)CONTRACTOR.
  - 1. PLUMBING (SUB)CONTRACTOR SHALL SUPPLY AND INSTALL ALL TRAPS, VALVES ETC AND SHALL MAKE FINAL CONNECTIONS TO ALL WASTE/VENTS, AND WATER LINES, ETC., AS REQUIRED TO MAKE SYSTEMS FULLY FUNCTIONAL.
  - 2. UNLESS OTHERWISE SHOWN, CASEWORK AND EQUIPMENT SUBCONTRACTOR SHALL MAKE SINK CUT-OUTS.
  - 3. SINK CABINETS TO BE INSTALLED BEFORE THE INSTALLATION OF ADJACENT CABINETS.
- G. ALL CONTRACTORS TO FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ARCHITECT IN WRITTEN FORM OF ANY DISCREPANCIES.
- H. PROVIDE ALL FILLERS AS REQUIRED. FINISH TO MATCH CASEWORK.
- I. UNLESS OTHERWISE SHOWN, RUBBER BASE ON ALL CASEWORK BY G.C.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Condition casework and furniture to average prevailing humidity conditions in installation areas prior to installing.

#### **3.2 INSTALLATION**

- A. Deliver, uncrate, set in place and install plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Before making cutouts, drill pilot holes in corners.
- B. Trim and Moldings: Install in single, unjointed lengths for openings and for runs less than maximum length of lumber available. For longer runs, use only one piece less than maximum length available in any straight run. Stagger joints in adjacent members.

- C. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- D. Adjust shelving heights (if applicable), as required and as directed by the Architect/Owner.
- E. Inspect for dents, scratches, stains, holes, etc. Replace any items showing damage, loose joints or other defects.

### **3.3 CLEANING AND PROTECTION**

- A. Clean and polish all items, remove packing cases and debris from the site.
- B. Protection: Perform all procedures and precautions for protection of materials and installed casework from damage by the work of other trades until acceptance of the work by the Owner.
- C. Cover casework with 4-mil polyethylene film for protection against soiling and deterioration during remainder of construction period.

**END OF SECTION 11000**



## SECTION 11011 - CASEWORK AND EQUIPMENT

### PART 1 - GENERAL

#### 1.1 DESCRIPTION OF WORK

- A. Section Includes: Wood casework and related equipment.
1. Pre-manufactured wood casework and equipment, covered by this specification and accompanying drawings, are manufactured or supplied by one manufacturer to avoid divided responsibility.
- B. Work included in this section:
1. Furnish all items of equipment as listed in the specifications, equipment schedule and/or as shown on the drawings, including delivery to the building, unpacking, setting in place, leveling, and scribing to walls and floors as required.
  2. **Furnishing:** Equipment Subcontractor shall make cutouts, holes and openings in countertops so as to be ready for installation of fixtures by the Plumbing Work (Sub)Contractor.
    - a. The Casework and Equipment Subcontractor(s) shall turn over to the Plumbing (Sub)Contractor in a package, all sinks, fixtures, faucets, tailpieces, strainers, etc., and nipples and locknuts, etc., for installation and final connection by the Plumbing (Sub)Contractor.
  3. The Casework and Equipment Subcontractor shall provide an itemized lists and a designated site location for the transfer of the above referenced materials to the Plumbing (Sub)Contractors. The list shall have a description of the items and quantity along with a sign-off line for the Plumbing (Sub)Contractor.
    - a. **A copy of the signed list is to be submitted to the Architect/Owner prior to billing for this equipment.**
  4. All debris, dirt and rubbish accumulated as a result of this installation shall be removed and the premises left clean and orderly.
  5. All contractors shall familiarize themselves with the job conditions and building measurements in order to coordinate the planning, design, connections, delivery and erection of the fixed casework and related equipment furnished under these specifications with other related and associated work during the term of this contract.
- C. Work included under the work of other contracts:
1. The **connection** of sinks, tailpieces, traps, service lines, drainlines, and piping within the equipment and through, under or along the backs of working surfaces as required by the specifications and/or as shown on the drawing shall be by the Plumbing and Drainage Work (Sub)Contractor in accordance with Part-4 Specifications Sections.

2. The furnishing of any framing or reinforcements for walls, or floors to support any equipment, General Construction Work Contractor in accordance with Part-2 Specifications Sections.

## 1.2 QUALITY ASSURANCE

- A. Provide all casework (for integration with tops, sinks and service fixtures, as required) manufactured or furnished by the same company for single responsibility.
- B. Basis of Design: **"Campbell Rhea - Classic Oak Series", as manufactured by Institutional Casework, Inc., Paris Tennessee; or approved equal.**
- C. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.
  1. Comparable products of the following manufacturers will be considered if it can be clearly shown that their products are equal to or will exceed the construction quality requirements and other design attributes listed above.
    - a. Wood-Metal Industries.
    - b. Diversified Woodcraft.
    - c. Leonard Peterson - Vanguard Line, Lipped.
    - d. Or approved equal.
  2. 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.
  3. Substitute products will be considered for substitution only when submitted to the Architect as per the requirements of AIA A201 and Section 00800.
  4. Substituted product(s) shall be meet the following minimum requirements:
    - a. All four corners of drawer boxes must be dove-tailed together, and the bottom of all drawer boxes must be let in to the sides, front and back, to be "fully captured." Applied drawer bottoms will not be permitted.
    - b. All drawer front shall be fabricated from solid red oak lumber.
    - c. All cabinet doors shall be framed with solid oak rails on four sides. Tall case doors shall include a lightweight core to reduce stress on hinges. Doors constructed of plywood or particleboard, edge-banded with oak will not be permitted. Tall case doors shall be mounted with (4) hinges.
    - d. All tall case doors shall be complete with three-point latching mechanism. Single-point latching will not be permitted.

5. The General Contractor will not award subcontract to a wood laboratory casework supplier who is not on the approved list, unless the Architect has approved that supplier's samples, certificates, individual product drawings, and proof of ability to perform.

### **1.3 SUBMITTALS**

- A. Submit two copies of manufacturer's data and installation instructions for each type of equipment.
- B. Samples:
  1. Submit samples of available laminated plastic patterns and colors for Architect's selection.
  2. Submit one full size sample of finished base cabinet unit complete with hardware, doors and drawers, without finish top.
  3. Submit one full size sample of finished wall mounted cabinet unit complete with hardware, doors and adjustable shelves.
  4. Acceptable sample units will be used for comparison inspections at project. Unless otherwise directed, acceptable sample units may be incorporated in the work. Notify Architect of their exact locations. If not incorporated in the work, retain acceptable sample units in the building until completion and acceptance of the work.
  5. Remove sample units from the premises when directed by the Architect.
- C. Shop Drawings
  1. Submit shop drawings showing plans, elevations, ends, cross-sections, service run spaces, locations and type of service fixtures with lines thereto. Show details and location of anchorages and fitting to floors, walls and base. Include layout of units with relation to surrounding walls, doors, windows, and other building components.
  2. Coordinate shop drawings with other work involved.
- D. **Test Reports - Certifications:**
  1. Submit the following:
    - a. Test reports certifying that the casework finish complies with chemical and other resistance requirements of the specifications.
    - b. Performance test reports from an independent testing lab on each specified top material.

### **1.4 PRODUCT HANDLING**

- A. Deliver casework only after wet operations in building are complete.

- B. Store completed wood furniture in ventilated place, protected from the weather, with relative humidity therein of 50% or less at 70°F.
- C. Protect sanded and finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective coating.

## 1.5 JOB CONDITIONS

- A. Advise Architect of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content.
- B. Examination of Substrate and Conditions
  - 1. Field measurements shall be taken to verify that the equipment will fit into the designated space. Entry ways, corridors and door openings shall be verified to ensure that the equipment be manufactured in a matter to permit it to be moved through properly into place.
  - 2. Examine the substrate and the conditions under which the work under this section is to be performed, and notify the Architect, in writing, of unsatisfactory conditions. Do not proceed with work under this section until satisfactory conditions have been corrected in an acceptable manner.

## 1.6 WARRANTY

- A. Manufacturer shall warrant the casework to be free from defects in materials and workmanship, under normal use and service, for **three (3) years** from date of delivery.
  - 1. Within the warranty period, manufacturer shall repair, replace, or refund the purchase price of defective casework.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. The best cabinet making practices for casework construction shall be followed. All cabinets shall be integral units, each completely enclosed without the use of common partitions unless otherwise specified.

### 2.2 MATERIALS

- A. Lumber:
  - 1. Oak lumber is red oak, grade FAS or better, air dried and kiln dried to a 6 percent moisture content, then tempered to 7-8 percent prior to fabrication. Red oak lumber exposed to view, is free of stains, splits, shakes, season checks and other similar defects.
  - 2. Other hardwoods are grade FAS or better, air dried to a 6 percent moisture content, then tempered to 7-8 percent prior to fabrication. Other hardwoods are used in semi-exposed, or unexposed, areas and comply with NHLA grading for FAS or better lumber.

B. Plywood:

1. Oak plywood is red oak, grade A-2, plain sliced, book-matched, crossbanded, and has a solid core.
  - a. 3/4 inch is a minimum of 7-ply.
  - b. 1/2 inch is a minimum of 5-ply.
  - c. 1/4 inch is a minimum of 3-ply.
  - d. 3/32 inch is a minimum of 3-ply.
2. Other hardwood plywoods are sound grade, have a solid core and are suitable for semi-exposed or unexposed areas.
  - a. 3/4 inch is a minimum of 7-ply.
  - b. 1/2 inch is a minimum of 5-ply.
  - c. 1/4 inch is a minimum of 3-ply.
  - d. 3/32 inch is a minimum of 3-ply.

C. Hardboard:

1. Hardboard is service tempered and consists of steam-exploded wood fibers, highly compressed into a hard, dense, 1/4 inch thick, homogeneous sheet, using natural resins and other added binders.
2. Physical properties:
  - a. Average modulus of rupture is 5,300 lbs./sq. inch
  - b. Density is 50 to 60 lbs./cu. foot
  - c. Tensile strength of 3,500 lbs./sq. inch.

D. Particleboard:

1. Particleboard is industrial grade.
2. Physical properties:
  - a. Density, 46 to 50 lbs./cu. ft.
  - b. Modulus of rupture, minimum, 2,200 psi
  - c. Modulus of elasticity, minimum, 450,000 psi.

E. Service Fixtures:

1. Water, gas, or other services: Triple chrome plated, have heavy-duty construction and are specifically designed for laboratory use.
  - a. **Water Faucets - Hot and Cold:** Faucets are cast from red brass, and have four-arm type handles with color coded indexes. Faucets have serrated hose nozzles. Faucets have patented REX unit ceramic disc cartridges, and replaceable seats. The stem is brass, with full Acme threads, and has a brass cap nut. Goosenecks are rigid. Fixture outlets are tapped 3/8 inch I.P.S. for aerators, vacuum breakers, hose connections, and or other accessories. Provide vacuum breakers.
    - (1) **Provide lever handle type faucet control for barrier-free applications in accordance with sink notes indicated on drawings.**

- b. **Vacuum Breakers:** Watts NLF-9, or comparable, vacuum breakers are brass with polished chrome plating, screw-in type with stainless steel working parts, and durable rubber diaphragm and disc. Vacuum breaker is for hot or cold faucet and has a primary valve with a soft disc that seats against mating part. The secondary check valve utilizes a soft disc to metal seating. Breaker is tapped 3/8 inch N.P.T.

2. Sinks and Sink Outlets:

- a. **Stainless steel** sinks have a satin finish. They are 18 gauge, type 304, 18-8 stainless steel, with heavily undercoated bottoms and positive pitch drains. Outlets are chrome plated brass. Drain holes are 3-1/2 inch diameter for 4-1/2 inch stainless steel cup strainers. The cup strainer has a neoprene stopper. Provide necessary tail pieces to tie into plumbing roughing, typical.

NOTE: Coordinate with Plumbing Drawings and Specifications.

F. Tops (See Equipment Schedule):

1. **Rheatex:** Top surface and edges are 0.050 inch thick, horizontal grade, **high pressure, plastic laminate** applied to a 46-50 lb. density particleboard core. Finished top is one inch thick, and the curb is four inches high unless specifically dimensioned higher on Equipment Plans. A phenolic backing sheet is applied to the bottom surface.
  - a. Colors: to be selected from manufacturer's available full range of colors.

G. Hardware and Accessories:

1. Pulls: Shall be selected by the Architect from manufacturer's available standard and custom units at no additional cost to the Owner.
2. Handles:
  - a. Latching handle LH-1 is die cast zinc alloy, 4-1/4 inches long, has a dull chrome plated finish. Handle operates with 1/4 turn. Double door cases have latching handles on the right door and dummy handles on the left door. The rods are 5/16 inch in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate which engages the side of the case, or latches behind the left door on cases with double doors.
  - b. Locking handle LK-1 is a latching handle with a lock mechanism incorporated into the handle head. On double door cases, the left door has a dummy handle, and the right door has the locking handle. Lock is laboratory grade with a 5-disc tumbler mechanism and a dull chrome plated face. Tumblers and keys are brass, while the plug and cylinder are die cast zinc alloy.
3. Locks:
  - a. Lock SL-1 is a laboratory grade, cylinder cam lock, with a 5-disc tumbler mechanism, and a dull chrome plated face. Tumblers and keys are brass, while plug and cylinder are die cast zinc alloy. Lock operates with a 180 degree turn of the

key. There are 500 key changes standard. Locks are keyed differently, master keyed and furnished with 2 keys per lock.

b. Locks are to be furnished on all doors and drawers.

4. Hinges:

a. Hinge CP-1 is heavy duty, institutional type, 5-knuckle hospital tipped, and made from .095 inch thick, chrome plated mild steel. Hinge is wrap around style, and 2-3/4 inches high. The wing for mounting to end panel has 4 holes, two of which are slotted for adjustability; wing for the door has 5 holes, two of which are slotted for adjustability.

b. Elbow catch is a steel, spring loaded catch that releases with finger pressure. The catch and steel strike plate are mounted with screws. Strike plate screw holes are slotted for adjustability and pin hole is provided to help anchor its position.

5. Drawer Slides:

a. Drawer slides DS-1 are electrostatically epoxy powder coated, cold rolled steel, heavy-duty, side mounted, and have a 150 lb. load capacity. They are equipped with heavy-duty, ball bearing nylon rollers for smooth effortless operation. Slides have automatic positive stop levers to prevent accidental drawer removal, but allow quick removal without tools.

b. File drawer slides FD-1 are zinc plated, cold rolled steel, heavy-duty, side mounted, and have a 100 lb. load capacity. They are equipped with heavy-duty, ball bearing nylon rollers. Slides are full extension with a positive stop, and a lift out disconnect.

6. Shelf Clips:

a. **Shelf support clips shall be "seismic" twin pin type for mounting on interior of cabinet work. Clips shall be corrosion resistant and shall retain shelves from accidental removal. Shelves in all cabinets are adjustable on 32mm centers.**

1) **Single pin support clips and surface mounted metal support strips and clips subject to corrosion are not acceptable.**

### 2.3 FABRICATION

A. Factory assembly of casework in the largest components possible aids in the installation. Mortise and tenon construction with glued and screwed joints is used for maximum strength; and the use of precision jigs and clamps ensures square corners and plumb vertical surfaces.

B. Fabrication of laboratory casework and equipment is completed to dimensions in the final, approved copy of shop drawings.

C. Base Cabinets:

1. All base cabinets are rigidly constructed, integral units with the strongest most advanced joinery methods utilized of bored, doweled, dadoed, glued and screwed construction.

Each base cabinet is completely enclosed without the use of common partitions, and has flush construction with overlapping doors and drawers, which provides a dust resistant interior. A base cabinet has a full horizontal top frame with bored, doweled and glued joints, intermediate front rails and a 3/4 inch plywood bottom; rear horizontal parting rails and separators are provided as required. Horizontal top frame, intermediate parting rails and the bottom are bored, doweled and glued. Separators where indicated, are let into routed intermediate rails. Backs are recessed and encapsulated into dadoed end panels and further secured with glue blocks on each side, except where they need to be removable for access to plumbing. Backs are screwed to the top frame and further secured with glue blocks on each side. An enclosed toe space, 2-1/4 inches by 4 inches, is furnished with the toe rail bored, doweled and glued to end panels.

D. Wall and Upper Cases:

1. All wall and upper cases are rigidly constructed, integral units with the strongest most advanced joinery methods utilized of bored, doweled, dadoed, glued and screwed construction. Each case is completely enclosed without the use of common partitions, and has flush construction with overlapping doors, which provides a dust resistant interior. Top panel is bored, doweled and glued into end panels. Bottom panel is bored, doweled and glued into end panels; and glued and screwed to the back. Backs are recessed and encapsulated into dadoed end panels, and further secured with glue blocks on each side. Exterior hanger rails, at the top of the back, are glued to the back and then screwed to the top panel and bored, doweled and glued into end panels. Exterior hanger rails, at the bottom of the back, are glued to the back and then screwed to the bottom panel and bored, doweled and glued into end panels. Adjustable shelves are supported on **“seismic” twin pin type** shelf clips, which fit into holes drilled 32 mm on centers, in the case end panels.

E. Tall Cases:

1. All tall cases are rigidly constructed, integral units with the strongest most advanced joinery methods utilized of bored, doweled, dadoed, glued and screwed construction. Each case is completely enclosed without the use of common partitions, and has flush construction with overlapping doors, which provides a dust resistant interior. Top panel is bored, doweled and glued into end panels. Bottom panel is bored, doweled and glued into end panels and glued and screwed to the back. An exterior back cross rail is provided at the top of each case, glued to the back, and then screwed to the top panel and bored, doweled and glued into the end panels. Additional back cross rails are provided, as required. Backs are recessed, let into dadoed end panels, and further secured with glue blocks at the sides. An enclosed toe space, 2-1/4 inches by 4 inches high, is furnished with toe rail securely bored, doweled and glued to end panels and bottom panel.
2. Rails:
  - a. Interior: 2-1/4 inches by 3/4 inch, solid hardwood
  - b. Exterior: 4-1/8 inches by 3/4 inch, solid oak
3. Top panel, bottom panel, dividers, fixed shelf and adjustable shelves:
  - a. Cases with exposed interiors: All are 1 inch oak plywood
  - b. Cases with unexposed interiors: All are 1 inch hardwood plywood.



4. Backs:
    - a. Cases with exposed interiors and exposed exteriors: Back is 1/4 inch oak plywood.
    - b. Cases with unexposed interiors and unexposed exteriors: Back is 1/4 inch service tempered hardboard.
  
  5. End panels:
    - a. Cases with exposed interiors: End panels are 3/4 inch oak plywood.
    - b. Cases with exposed exteriors: end panels are 3/4 inch oak plywood.
    - c. Cases with unexposed interiors and one exposed end panel and one unexposed end panel: Exposed end panel is 3/4 inch oak plywood; unexposed end panel is 3/4 inch hardwood plywood.
    - d. Cases with unexposed interiors and unexposed exteriors: end panels are 3/4 inch hardwood plywood.
  
  6. Exposed edges of end panels, dividers and shelves are edge banded with 1/4 inch solid oak.
  
  7. Exterior back cross rails: 3 inches by 3/4 inch hardwood plywood.
- F. Drawers:
1. Components:
    - a. Drawer front: 13/16 inch oak lumber.
    - b. Drawer sides and back: 1/2 inch hardwood lumber.
    - c. Drawer bottom: 1/4 inch service tempered hardboard.
    - d. Construction: All four corners of the drawer are dovetailed and glued. Edges of the drawer front are machine radiused to form a lip and overlap the opening 1/4 inch on all sides. Drawer fronts are one piece of lumber, providing consistency in color and grain within each drawer front. The back perimeter of the drawer front is routed so drawer front is recessed into the opening and projects 13/32 of an inch. The top edge of drawer sides and back are radiused. The bottom is let into the box on four sides and securely glued underneath with a continuous bead of glue around the perimeter of the drawer bottom. In cabinets 24 inches or less in width, drawers have one, AL-1 aluminum pull which is surface mounted with 2 screws, 4 inches on centers. In cabinets over 24 inches wide, drawers have two AL-1 aluminum pulls. Drawers are supported on DS-1 slides which are side mounted, heavy duty, electrostatically epoxy powder coated, cold rolled steel, and have a 150 lb. load capacity. Slides are equipped with heavy-duty, ball bearing nylon rollers for smooth effortless operation. DS-1 slides have automatic, positive stop levers to prevent drawer's accidental removal, but allow for quick removal without tools. File drawers are supported on side mounted FD-1 full extension steel slides. File drawers have an interior, screw mounted, metal bottom track and an adjustable metal file follower. Lock SL-1 is furnished when indicated.

G. Doors:

1. Hinged solid doors, 48 inches or less in height:
  - a. Core ply: Solid oak rails on four edges framing a particleboard core.
  - b. Hardwood plywood crossbands: Four; two laminated on each side of core ply.
  - c. Red oak veneer: Face plys; one applied to each side.
  - d. Construction: Hinged solid doors, 48 inches or less in height, are 13/16 inch thick and have solid oak rails on the four edges. Doors overlap the opening 1/4 inch on all sides and have machined radiused edges. Doors have one aluminum pull which is surface mounted with two screws. Doors have two, CP-1 chrome plated, heavy duty, institutional type, 5-knuckle hospital tipped hinges, each attached with 5 tempered steel screws into solid oak framing of door, and 4 Euro screws into the end panel. Doors are secured by zinc plated steel, friction roller catches, with positive action, spring cushioned, polyethylene roller, and a metal strike plate. Catch and steel strike plate are attached with screws. On lockable double door cabinets, the left door is secured with a steel, spring loaded, elbow catch that releases with finger pressure. The catch and the strike plate are attached with screws. Strike plate screw holes are slotted for adjustability and a pin hole is provided to help anchor plate's position. Lock SL-1 is furnished when indicated.
2. Hinged solid doors over 48 inches in height:
  - a. Core ply: Solid oak rails on four edges framing a particleboard core.
  - b. Hardwood plywood crossbands: Four; two laminated on each side of core ply.
  - c. Red oak veneer: Face plys; one applied to each side.
  - d. Construction: Hinged solid doors over 48 inches in height, are one inch thick and have solid oak rails on the four edges. Doors overlap opening 1/4 inch on all sides, and machined radiused edges. Single doors and right door of double doors have a LH-1 latching handle, which is 4-1/4 inches long, streamline design, with a dull chrome plated finish. Handle operates with 1/4 turn. Left door of double doors has a fixed handle, which is the same size and finish as a LH-1 latching handle. A three point latching system provides single doors and right door of double doors positive engagement at the top and bottom of the door with tapered aluminum rods which engage plastic strike plates and pull the door snug. The rods are 5/16 inch in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate which engages the side of the case, or latches behind the left door on cases with double doors. Right door of double doors lap over the integral machined astragal on left door, securely holding door shut. Doors have three, CP-1 chrome plated, heavy duty, institutional type, 5-knuckle hospital tipped hinges; each attached with 5 tempered steel screws in to solid oak framing of the door, and 4 Euro screws into the end panel. Left door of double doors is additionally secured with two zinc plated steel, friction roller catches, with positive action, spring cushioned, polyethylene roller, and a metal

strike plate. Catches and steel strike plates are attached with screws. Catch screw holes are slotted for adjustability, and the strike plate has two nips to help anchor its position. Locking handle LK-1 is furnished when indicated.

#### H. Casework Finishes:

1. Surfaces to be Finished: Exposed exterior and exposed interior surfaces of cabinets receive the full finishing process. The unexposed interior surfaces of cupboards, drawers, wall cases, upper cases, and tall cases receive a baked on protective coat of moisture and chemical resistant catalyzed sealer, and a top coat of clear, catalyzed conversion varnish. Other unexposed surfaces are processed through standard finishing steps, and receive a baked on protective coat of moisture and chemical resistant catalyzed sealer.
2. Finishing Process: Prior to assembly lumber for doors, drawers and cabinets, and plywood for cabinets, are machine sanded with 120 grit, 180 grit, and finally, 220 grit sand paper. Flat surfaces receive two additional machine sandings: one in an orbital crossbelt sander with 40 micron and 60 micron grit sanding belts; and, one through a rotary polisher with 150 grit sand paper. Door and drawer front edges are machine sanded to a very smooth surface through a profile edge sander utilizing a 100 grit and a 150 grit paper. After assembly, drawers, doors, and casework are thoroughly examined and fine-finished by hand to provide a consistently smooth surface. Prior to the first application in the finishing process, items are placed in the dust-off booth where compressed air is used to remove loose fibers and dust. Selected surfaces are stained with NGR stain to the desired color and allowed to dry. Next a protective coat of moisture and chemical resistant, catalyzed sealer is applied. After flash drying, items are oven baked at 130°F. Following a cool down period, surfaces that receive the final top coat are carefully hand sanded and wiped clean. A top coat of clear, catalyzed, conversion varnish is applied, allowed to dry, and then oven baked at 130°F. The final top coat provides chemical resistance, toughness, durability, and excellent color stability with a smooth finish and high-gloss lustre.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Condition casework and furniture to average prevailing humidity conditions in installation areas prior to installing.

#### **3.2 INSTALLATION**

- A. Install plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Before making cutouts, drill pilot holes at corners. Install wall cabinets in accordance with details on drawings.
- B. Trim and Moldings: Install in single, unjointed lengths for openings and for runs less than maximum length of lumber available. For longer runs, use only one piece less than maximum length available in any straight run. Stagger joints in adjacent members.

- C. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

### **3.3 CLEANING AND PROTECTION**

- A. Repair or remove and replace defective work as directed upon completion of installation.
- B. Protection: Perform all procedures and precautions for protection of materials and installed casework from damage by the work of other trades until acceptance of the work by the Owner. Advise HVAC Contractor of the required temperature/humidity conditions which must be maintained during the remainder of the construction period.
- C. Cover casework with 4-mil polyethylene film for protection against soiling and deterioration during remainder of construction period.
- D. Clean up cut out pieces, sawdust and debris, packing cases, etc. Leave areas in broom clean condition. Remove all debris as a result of work of this Contract.

**END OF SECTION 11011**

## **SECTION 13341 – METAL BUILDING SYSTEMS**

### **PART 1 – GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Steel framed metal building system generally using profiled and pre-coated metal roof.

#### **1.02 SUMMARY**

- A. This Section includes Furnishing and delivery of components and assemblies of metal building systems and accessories which will include but are not limited to the following:
  - 1. Structural framing.
  - 2. Roof panels.
  - 3. Roof Insulation.
  - 4. Wall panels and liner panel skin.
  - 5. Wall Insulation.
  - 6. Gutters, downspouts, flashing, accessories and trim.
  - 7. All other associated work in accordance with Contract Documents.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations and anchor-bolt installation.
  - 2. Division 4 Section "Unit Masonry" for masonry exterior walls and masonry work.
  - 3. Division 7 Section "Building Insulation" for rigid perimeter insulation.
  - 4. Division 7 Section "Sealant" for sealant work installed in roofs and walls.
  - 5. Division 13 Section "Erection of Metal Building Systems".

#### **1.03 REFERENCES**

- A. AISC Manual of Steel Construction (ASD ninth edition).
- B. AISI Specifications for the Design of Cold-Formed Steel Structural Members (latest edition).
- C. MBMA Low Rise Building System Manual.
- D. IBC 2018 (NJBC 19)

#### **1.04 SYSTEM DESCRIPTION**

- A. Jurisdictional Design Requirements
  - 1. Roof Live load 20 lbs.
  - 2. Wind load of 123 mph

3. Wind exposure C
4. Ground Snow load 2 psf.
5. Importance factor of 1.0 for wind and 1.0 on seismic

## 1.05 SUBMITTALS

- A. Design Calculations reviewed and stamped by an Engineer of the State of New Jersey.
- B. Approval Drawings and Anchor Bolt Plan reviewed and stamped by an Engineer of the State of New Jersey.
- C. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following metal building system components:
  1. Structural-framing system.
  2. Roof and soffit panels.
  3. Wall panels and liners.
  4. Wall and Roof Insulation.
  5. Trim and closures.
  6. Accessories.
- D. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other Work.
  1. Include structural analysis data. Drawings and data shall be signed and sealed by the qualified professional structural engineer licensed to practice in the State of New Jersey who will be responsible for their preparation.
  2. Anchor-Bolt Plans: Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
  3. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
  4. Roof and Wall Panel Layout Drawings: Show layouts of panels on support framing, details of edge conditions, joints, panel profiles, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work.
  5. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
    - a. Gutters.
    - b. Downspouts.
- E. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of the following products with factory-applied color finishes:
  1. Roof and wall panels.

2. Trim and closures.
  3. Accessories.
- F. Product Certificates: Signed by manufacturers of metal building systems certifying that products furnished comply with requirements.
1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
    - a. Name and location of Project.
    - b. Order number.
    - c. Name of manufacturer.
    - d. Name of Contractor.
    - e. Building dimensions, including width, length, height, and roof slope.
    - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
    - g. Governing building code and year of edition.
    - h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic zone or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
    - i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
    - j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
    - k. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
- B. Welding Certificates: Copies of certificates for welding procedures and personnel.
- C. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements. Include evidence of manufacturing experience.
- D. Qualification Data: For firms and persons specified in "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.
- E. Material Test Reports: From a qualified testing agency indicating and interpreting test results of steel for compliance with requirements indicated.
- F. Erection Drawings showing method of assembly.

## 1.06 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located (State of New Jersey) and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for of fabrication of metal building systems that are similar to those indicated for this Project in material, design, and extent.

- B. **Manufacturer Qualifications:** A firm experienced in manufacturing metal building systems similar to those indicated for this Project and with a record of successful in-service performance.
  - 1. Member of MBMA.
  - 2. **Engineering Responsibility:** Preparation of Shop Drawings, testing program development, test result interpretation, and comprehensive engineering analysis by a qualified professional engineer.
- C. **Testing Agency Qualifications:** An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- D. **Source Limitations:** Obtain each type of metal building system component through one source from a single manufacturer.
- E. **Product Options:** Drawings indicate size, profiles, and dimensional requirements of metal building system and are based on the specific system indicated. Other manufacturers' systems with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
  - 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.
- F. **Welding:** Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code–Steel"; and AWS D1.3, "Structural Welding Code–Sheet Steel."
- G. **Regulatory Requirements:** Fabricate and label structural framing to comply with special inspection requirements at point of fabrication for welding and other connections required by authorities having jurisdiction.
- H. **Structural Steel:** Comply with AISC S335, "Specification for Structural Steel Buildings–Allowable Stress Design, Plastic Design"; or AISC S342, "Load and Resistance Factor Design Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- I. **Cold-Formed Steel:** Comply with AISI SG-671, "Specification for the Design of Cold-Formed Steel Structural Members," and AISI SG-911, "Load and Resistance Facet Design Specification for Steel Structural Members," for design requirements and allowable stresses.
- J. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements of the Owner's Project Manager's requirements indicated in Division 1 Sections. Review methods and procedures related to metal building systems including, but not limited to, the following:
  - 1. Inspect and discuss condition of foundations and other preparatory work performed by other trades.



2. Review structural load limitations.
  3. Review and finalize construction schedule and verify availability of materials, Erector's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Review required testing, inspecting, and certifying procedures.
  5. Review weather and forecasted weather conditions and procedures for unfavorable conditions.
- K. Building manufacturer must be AC-472 certified facility.

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

- A. Deliver primary frames, secondary framing, panel, trim, flashing, accessories, bolts, nuts, washer and other erection hardware. All boxes should be unopened.
- B. Store material off ground and protect from damage. Slope secondary materials and panel packages to avoid moisture accumulation and provide drainage.
- C. Handle material properly to protect from damage.

### **1.08 WARRANTIES**

- A. All materials will be covered under the MBMA's required **one (1) year** manufacturer's defect warranty to replace any defective materials.
- B. Roof panels and trims are covered under the coatings manufacturer's **forty (40) year** warranty (this varies by color and building site location see coatings manufacturer's warranty for restrictions) against blistering, peeling, cracking, or checking.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURER**

- A. Basis of Design Manufacturer: Braemar Building Systems; 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. Chief Buildings;
  2. Nucor Building Systems;
  3. Or approved equal.

### **2.02 FRAMING MATERIALS**

- A. Structural Framing Members: Manufactured from ASTM A529, ASTM A570 or ASTM A572, 50 KSI yield stress shop factory primed with red oxide primer.

B. Secondary Framing Members: Manufactured from ASTM A653 factory primed red oxide primer.

1. Roof purlins will be lapped to act as a continuous member to insure strength and stability
2. Spandrel beams will be flush and designed to take the wind force created by the block walls. Must have a minimum of a L/180 deflection.

C. Structural Bolts and Nuts

1. Primary Framing: Use ASTM A325.
2. Secondary Framing: Use ASTM A307.

D. Rod Bracing: red oxide primed.

### 2.03 INSULATED ROOF AND WALL PANELS

A. Basis of Design Panel: Sandwich panel produced by Metl-Span, #LS-36, 4 in. thick (R-Value = 30.58); or approved equal.

1. Lap Seam, Exposed Fastener, Foamed-Insulation-Core Metal Wall and Roof Panels: Structural metal panels consisting of exterior metal sheet with three major tapered ribs and two minor ribs between each major rib, and interior metal sheet, with factory foamed-in-place polyurethane core in thermally-separated profile, with tongue-and-groove panel edges, attached to supports using exposed fasteners.
2. G-90 Galvanized Coated Steel: ASTM A 653, structural quality, Grade 50, Coating Class AZ-50 (Grade 340, Coating Class AZM150), pre-painted by the coil-coating process per ASTM A 755/A 755M.

B. Coverage: 36 inch wide.

C. Exterior Panel: 24 gauge Fluoropolymer standard **forty (40) year** warranty (this varies by color and building site location consult coatings manufacturer's warranty for restrictions).

D. Interior Panel: 26 gauge Igloo White.

### 2.04 TRIMS

A. Gable trim shall be building manufacturer's sculptured trim.

B. Gutters and down spout shall be building manufacturer's standard materials with down spout space to accommodate the site locations average rain fall conditions.

C. All trims are to be 26 gauge.

D. Finish: Fluoropolymer with the coatings manufacturer's standard **forty (40) year** warranty (this varies by color and building site location consult coatings manufacturer's warranty for restrictions).

## 2.05 MANUFACTURED UNITS

- A. Manufactured Building System Main Frame Type: Dual pitch roof buildings shall have tapered columns using interior pipe column.
- B. Fabrication:
  - 1. Structural Framing
    - a. Fabricated by continuous welding cut-to shape web sections to plate steel flange sections.
    - b. Punch or drill butt-plates and base plates for field bolted assembly.
    - c. Hold fabrication tolerances for primary and secondary to those listed by AISC and AISI.
    - d. Clips welded to frame for purlin and girt attachment with bolts.
  - 2. Secondary
    - a. Fabricated by precise roll-forming or press brake.
    - b. All openings framing to be fabricated from minimum 16 gauge.
    - c. Purlins are to be strapped to prevent rolling with a standing seam roof.
- C. Finishes:
  - 1. Shop Primed
    - a. Clean metal surface of loose scale, shavings and oil in compliance with SSPC-SP-3.
    - b. Apply one coat of manufactures standard red oxide primer.

## PART 3 – EXECUTION

### 3.01 INSPECTION

- A. Site verification of conditions: Examine conditions under which work is to be done. Do not proceed until unsatisfactory conditions have been corrected.

### 3.02 ERECTION

- A. Use templates for accurate setting of anchor bolts. Level bearing plates area with steel wedges or shims and grout.
- B. Erect building frame true and level with vertical members plumb and bracing properly installed. Maintain structural stability of frame during erection.
- C. Ream holes requiring enlargement to admit bolts. Burned holes for bolted connections are not permitted without written approval from the manufacturer.
- D. Tighten bolts and nuts in accordance with “specification for structural joints using ASTM A325 or ASTM A490 bolts” using specified procedure.
- E. Install roof panel in accordance to manufacturer current installation manual.

F. Provide trim, flashing and closures as required for weather-tight installation and appearance.

**END OF SECTION 13341**

## **SECTION 13342 - ERECTION OF METAL BUILDING SYSTEMS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the inventory, unloading, and erection of metal building systems and assemblies and indicated accessories, items, materials, etc. which include but is not limited to the following:
  - 1. Structural framing.
  - 2. Roof and soffit panels.
  - 3. Wall panels and liners.
  - 4. Accessories, flashing and trim.
  - 5. All work associated in accordance with Section 13341.
  - 6. Work shall include handling; unload, store, protect and erect metal building assemblies, roof and wall panels to prevent bending, warping, twisting, and surface damage.
- B. Related Sections include the following:
  - 1. Section 03300 - Cast-in-Place Concrete for concrete foundations, anchor-bolt installation, and floor slab.
  - 2. Section 04200 - Unit Masonry for masonry exterior walls and interior masonry work.
  - 3. Section 07200 - Building Insulation for perimeter insulation.
  - 4. Section 08330 - Insulated Rolling Service Door for coordination of framing.
  - 5. Section 13341 - Metal Building System, for coordination of structural framing, roof and soffit panels, wall panels, other components which shall be furnished under the work of other Contract.

#### **1.3 PROJECT CONDITIONS**

- A. Field Measurements: Verify metal building system foundations by field measurements before metal building fabrication and indicate measurements on Shop Drawings. Coordinate with

manufacturer for fabrication and delivery schedules with construction progress to avoid delaying the Work.

1. Established Dimensions for Foundations: Where field measurements cannot be made without delaying the Work, establish foundation dimensions and inform the manufacturer to proceed with fabricating structural framing without field measurements and advise Owner / Architect.
  - a. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
2. Established Dimensions for Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and inform the manufacturer to proceed with fabricating roof and wall panels without field measurements and advise Owner / Architect .
  - a. Coordinate roof and wall construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

#### 1.4 COORDINATION

- A. Coordinate size and location of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."
- B. Coordinate size of Doors for required metal framing.
- C. Coordinate delivery time with the manufacturer of building components and advise the Owner / Architect.

### PART 2 - INSTALLER QUALIFICATION

#### 2.1 PROJECT REQUIREMENTS

- A. **Erector Qualifications: An experienced erector / installer who has specialized in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.**
- B. Submit the following:
  1. A list of similar projects installed in the recommended past five (5) years.
  2. Project's name, location, building size, and contact information for manufacturer / fabricator and Owner.
- C. Review shop drawings and product data submitted and confirm compliance with building design requirements.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine all materials, products, framing assemblies, and all other components. Provide the Owner's Project Manager with records of inventory of quantities, sizes, dimensions, etc. of all materials, products, framing assemblies, and other components delivered to the project site and which shall be stored, protected and erected under the work of this section.
  - 1. Submit proof of insurance coverage and certificates to the Owner / Architect.
- B. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of metal building system.
  - 1. For the record, prepare written report, endorsed by Erector, listing conditions detrimental to performance of work.
  - 2. Proceed with erection only after unsatisfactory conditions have been corrected.
- C. Before erection proceeds, survey elevations and locations of concrete and masonry bearing surfaces, baseplates, and anchor bolts to receive structural framing. Verify compliance with requirements and metal building system manufacturer's tolerances.
  - 1. Engage land surveyor to perform surveying.

### **3.2 PREPARATION**

- A. Clean substrates of substances, including oil, grease, rolling compounds, incompatible primers, and loose mill scale, that impair bond of erection materials.
- B. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

### **3.3 ERECTION**

- A. Erect metal building system according to manufacturer's written instructions and erection drawings. Obtain manufacturer's written instructions and erection drawings prior to start of any installation work
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional structural engineer.
- C. Set structural framing in locations and to elevations indicated and according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

- D. Base Plates and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces before setting base plates and bearing plates. Clean bottom surface of base plates and bearing plates.
1. Set base plates and bearing plates for structural members on wedges, shims, or setting nuts.
  2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of baseplate or bearing plate before packing with grout.
  3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
    - a. Comply with manufacturer's written instructions for proprietary grout materials.
- E. Align and adjust framing members before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Make adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure.
  2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
- F. Primary Framing and End Walls: Erect framing true to line, level, plumb, rigid, and secure. Level base plates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist cure grout for not less than seven days after placement.
1. Make field connections using high-strength bolts. Tighten bolts by turn-of-the-nut method.
- G. Secondary Framing: Erect framing true to line, level, plumb, rigid, and secure. Fasten secondary framing to primary framing using clips with field connections using non-high-strength bolts. Hold rigidly to a straight line by sag rods.
1. Provide rake or gable purlins with tight-fitting closure channels and fascia.
  2. Locate and space wall girts to suit door and window arrangements and heights.
  3. Locate canopy framing, as indicated.
  4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications,



Load Tables, and Weight Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
  2. Space, adjust, and align joists accurately in location before permanently fastening.
  3. Install temporary bracing and bridging, connections, and anchors to ensure that joists are stabilized during construction.
  4. Bolt joists to supporting steel framework using carbon-steel bolts, unless otherwise indicated.
  5. Bolt joists to supporting steel framework using high-strength structural bolts, unless otherwise indicated.
    - a. Comply with RCSC's "Allowable Stress Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
    - b. Comply with RCSC's "Load and Resistance Factor Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
  6. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
- I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
1. Tighten rod and cable bracing to avoid sag.
  2. Locate interior end bay bracing only where indicated.
- J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to building structural frame.

### **3.4 ROOF PANEL INSTALLATION**

- A. General: Provide roof panels of full length from eave to ridge when possible. Install panels perpendicular to purlins.
1. Field cutting by torch is not permitted.
  2. Rigidly fasten eave end of roof panels and allow ridge end free movement due to thermal expansion and contraction. Pre-drill panels.
  3. Provide weatherseal under ridge cap.

4. Flash and seal roof panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
  5. Install screw fasteners with power tools adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
  6. Use aluminum or stainless-steel fasteners for exterior applications and galvanized fasteners for interior applications.
  7. Locate and space fastenings in true vertical and horizontal alignment.
  8. Install ridge caps as roof panel work proceeds.
  9. Locate panel splices over, but not attached to, structural supports. Stagger panel splices to avoid a four-panel lap splice condition.
- B. Standing-Seam Roof Panels: Fasten roof panels to purlins with concealed clips at each standing-seam joint. Install clips over top of insulation at location and spacing determined by manufacturer.
1. Install clips to supports with self-drilling fasteners.
  2. Crimp standing seams with manufacturer-approved motorized seamer tool so clip, panel, and factory-applied side-lap sealant are completely engaged.
  3. At panel splices, nest panels with minimum 6-inch end lap, sealed with butyl sealant and fastened together by interlocking clamping plates.

### **3.5 WALL PANEL INSTALLATION**

- A. General: Provide insulated panels full height of building when possible. Install panels perpendicular to girts.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Install panels with vertical edges plumb. Lap ribbed or fluted sheets one full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
  2. Unless otherwise indicated, begin panel installation at corners with center of rib lined up with line of framing.
  3. Field cutting by torch is not permitted.
  4. Align bottom of wall panels and fasten with blind rivets, bolts, or self-tapping screws.
  5. Fasten flashing and trim around openings and similar elements with self-tapping screws.
  6. When two rows of panels are required, lap panels 4 inches minimum. Locate panel splices over structural supports.

7. When building height requires two rows of panels at gable ends, align lap of gable panels over wall panels at eave height.
8. Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
9. Provide weather-resistant escutcheons for pipe and conduit penetrating exterior walls.
10. Flash and seal wall panels with weather closures under eaves and rakes, along lower panel edges, and at perimeter of all openings.
11. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as necessary for waterproofing. Handle and apply sealant and backup according to sealant manufacturer's written instructions.
12. Use aluminum or stainless-steel fasteners for exterior applications and galvanized fasteners for interior applications.
13. Locate and space fastenings in true vertical and horizontal alignment.

### **3.6 ACCESSORY INSTALLATION**

- A. General: Install gutters, downspouts, ventilators, louvers, and other accessories according to manufacturer's written instructions, with positive anchorage to building and weathertight mounting. Coordinate installation with flashings and other components.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
  1. Install exposed flashing and trim 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. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
  2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
  3. Separations: Separate metal from incompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

- C. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 4 feet (1.2 m) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
  - 1. Provide elbow at base of downspout to direct water away from building.
  - 2. Tie downspouts to underground drainage system indicated.
- E. Louvers: Set louvers complete with necessary hardware, anchors, dampers, weather guards, and equipment supports according to manufacturer's written instructions. Locate and place louver units level, plumb, and at indicated alignment with adjacent work.
  - 1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
  - 2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
  - 3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
  - 4. Install concealed gaskets, flashings, joint fillers, and insulation, as louver installation progresses, where required to make louver joints weathertight. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.
- F. Pipe Flashing: Form flashing around pipe penetration and roof panels. Fasten and seal to roof panel as recommended by manufacturer.

### **3.7 ERECTION AND LOCATION TOLERANCES**

- A. Structural-Steel Erection Tolerances: Comply with erection tolerance limits of AISC S303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Roof Panel Installation Tolerances: Shim and align units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Wall Panel Installation Tolerances: Shim and align units within installed tolerance of 1/4 inch in 20 feet on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- D. Door Installation Tolerances: Fit doors in frames within clearances specified in SDI 100.

### **3.8 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified independent testing agency to perform field quality-control testing.
- B. Extent and Testing Methodology: Testing and verification procedures will be required of high-strength bolted connections.
  - 1. Bolted connections will be visually inspected.
  - 2. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Load and Resistance Factor Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
  - 3. Field-bolted connections will be tested and verified according to procedures in RCSC's "Load and Resistance Factor Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Testing agency will report test results promptly and in writing to the Architect, Owner's Project Manager and the Manufacturer.

### **3.9 ADJUSTING**

- A. Louvers: After completing installation, including work by other trades, lubricate, test, and adjust units to operate easily, free from warp, twist, or distortion.
  - 1. Adjust louver blades to be weathertight when in closed position.

### **3.10 CLEANING AND PROTECTION**

- A. Touch-up Painting: Immediately after erection, clean, prepare, and prime or reprime welds, bolted connections, and abraded surfaces of prime-painted primary and secondary framing, accessories, and bearing plates.
  - 1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
  - 2. Apply compatible primer of same type as shop primer used on adjacent surfaces.
- B. Touch-up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded surfaces of shop-painted primary and secondary framing, accessories, and bearing plates are included in Division 9 Section "Painting."
- C. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- D. Roof and Wall Panels: Remove temporary protective coverings and strippable films, if any, as soon as each panel is installed. On completion of panel installation, clean finished surfaces

as recommended by panel manufacturer and maintain in a clean condition during construction.

1. Replace panels that have been damaged or have deteriorated beyond successful repair by finish touch-up or similar minor repair procedures.
- E. Louvers: Provide temporary protective coverings where needed and approved by louver manufacturer. Remove protective covering at time of Substantial Completion.
1. Restore louvers and vents damaged during installation and construction period, so no evidence remains of correction work. If results of restoration are unsuccessful, as judged by Architect, remove damaged units and replace with new units.
    - a. Clean and touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.
  2. Test operation of adjustable wall louvers and adjust as needed to produce fully functioning units.

**END OF SECTION 13342**

## **SECTION 13400 - BULLET RESISTANT PRODUCTS**

### **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. Bullet Resistant Fiberglass Wall Armor Panels.

#### **1.3 RELATED SECTION(S)**

- A. Section 09250 - Gypsum Drywall.

#### **1.4 REFERENCES**

- A. NIJ Standard 0108.01 - (National Institute of Justice) Standard for Ballistic Resistant Protective Materials.
- B. Underwriters Laboratories: UL 752 - Standard for Bullet Resisting Equipment.

#### **1.5 PERFORMANCE REQUIREMENTS**

- A. Design, fabricate and install all partition materials specified in this section to meet or exceed the requirements of UL 752.

#### **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. Shop Drawings: Submit Manufacturer approved shop drawings detailing plan, section and elevation views as necessary to ensure proper field installation procedures. Coordinate locations with those listed in the Contract Drawings.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

#### **1.7 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied

by a single manufacturer with a recommended minimum of ten (10) years experience.

- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a recommended minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
- C. Mock-Up: Provide a mock-up for evaluation 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 copy of the manufacturer's **standard limited warranty** against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Basis of Design: Total Security Solutions, Fowlerville, MI; Tel: 888.839.6752; or approved equal.

### **2.2 COMPONENTS**

- A. USFA bullet resistant fiberglass panels comprised of a multi-ply laminated ballistic fiberglass material.
  - 1. Fiberglass is a lightweight, easy to fabricate, nonspall and non-ricohet.
  - 2. Standard fiberglass panel size: 48" x 96".
  - 3. Ballistic Protection: Level 2 = 5/16 thick panel.



## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **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.

### **3.3 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install 4" wide fiberglass wall armor batten strips at each panel seam, in accordance with the manufacturer's recommended instructions.

### **3.4 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 13400**

**PART 3 - STRUCTURAL & MISCELLANEOUS 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.
  - 1. Section 2.1 to include "Lintels shown or otherwise enumerated or scheduled."
  - 2. Section 4.4, The first two sentences of this section are to be replaced with the following, "Shop drawings are to be made by the fabricator, prints thereof are to be submitted to the structural engineer and architect for their examination and approval. These shop drawings are to be submitted in minimum of the following three phases: Anchor bolt plans and advanced shipment pieces; Erection plans and thirdly; Piece details (maximum of 100 sheets per submission). The fabricator is to await the receipt of the previous phase prior to submission of the next phase. The fabricator is to include an allowance of fourteen (14) calendar days in his schedule for the review of these drawings by the structural engineer for the return of shop drawings. These calendar days start from the time the drawings are received by the engineer."
- 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 "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", including "Commentary" and Supplements thereto as issued.
- C. AISC "Specifications for Architecturally Exposed Structural Steel".
- D. 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.
- E. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel".
- F. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".
- G. 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 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. Owner to 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.
- K. In addition to visual inspection, field-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at testing agency's option.
  - 1. Liquid Penetration Inspection: ASTM E 165.
  - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
  - 3. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T."
  - 4. Ultrasonic Inspection: ASTM E 164.

### **3.3 STEEL ALLOWANCE**

- A. Provide and include in this bid a lump sum of \$5,000 (1 ton of steel @ \$5,000. 00 per ton) of fabricated and erected steel. This steel shall be provided at any time until final acceptance of this contract by the Architect. This steel may consist of W. F. Sections, angles, frames or various miscellaneous steel. Include shop drawings, fabrication and erection in this item.
  - 1. Upon completion of the project, any of the allowance work not used, shall be credited to the Owner against the contract price at the rate of two dollars and fifty cents (\$2.50) per pound.

**END OF SECTION 05120**



## **SECTION 05310 - 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, sump pans, cant strips, cut openings, special jointing or other accessories.
- C. Provide acoustical inserts for metal deck for installation by others.

#### **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.
  - 1. Composite Metal Floor Deck Units:
    - a. Canam-United Steel Deck
    - b. New Millennium Building Systems
    - c. Nucor-Vulcraft Group
    - d. Or approved equal.

## **2.2 MATERIALS**

- A. Steel for Galvanized Metal Deck Units: ASTM A 652, Grade 40 or higher – Floor Decking.
- B. Steel for Painted Metal Deck Units: ASTM A 652, Grade 40 or higher – Floor Decking
- C. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.
- D. Galvanizing: ASTM A 653, G60.
- E. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).
- F. 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. Open-Beam Composite Units: Fabricate deck units with integral embossing or raised pattern to furnish mechanical bond with concrete slabs. Fabricate open-beam units with fluted section having interlocking side laps: 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 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. 10 or larger machine screws, unless a closer spacing or a larger screw is called for on the drawing.
- K. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work shown.
- L. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units, except where taped joints are required.
- M. Pour Stops: Weld continuous pour stops to supporting decking units or structural steel supports with a minimum 1" long weld at 12" on center. Install pour stop with a minimum of 2" bearing on supports.
  - 1. Provide pour stops at edge of all slabs, all openings and as indicated on drawings.
- 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 owner 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 05310**

## 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, wall openings whether or not shown on structural 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 and sizes of floor penetrations; ducts, piping, raceways, etc.
      - 3) 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.
- 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 Framed Stairs:
    - a. Metal Stairs
  - 3. Steel railings, handrails, and guardrails at stair.
- D. Related Sections:
  - 1. Section 01400 - Testing Laboratory Service
  - 2. Section 03300 - Concrete Work
  - 3. Section 04200 - Unit Masonry
  - 4. Section 05120 - Structural Steel

5. Section 05300 - Metal Decking
6. Section 05400 - Miscellaneous Structural Steel
7. Section 05500 - Metal Fabrications
8. Section 09900 - Painting
9. Division 15 - Mechanical Work

### **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 stringers, tread pans, platforms, 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, steel stairs 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 designed 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.

## **2.4 STEEL FRAMED STAIRS**

1. General: Construct stairs to conform to sizes and arrangements indicated; join pieces together by welding unless otherwise indicated.
  - a. Provide complete stair assemblies including metal framing, hangers, columns, railings, newels, balusters, struts, clips, brackets, bearing plates and other components necessary for the support of stairs and platforms and as required to anchor and contain the stairs on the supporting structure.
2. Stair Framing: Fabricate stringers of structural steel channels, plates, or a combination of both as indicated.
  - a. Provide closures for exposed ends of stringers.
  - b. Construct platforms of structural steel channel headers and miscellaneous framing members as indicated.

- c. Bolt or weld headers to strings, newels and framing members to strings and headers; fabricate and join so that bolts, if used, do not appear on exposed finish surfaces.
  - d. Provide continuous steel scribe plates at masonry walls. Match stringer width.
3. Where masonry walls support steel stairs, provide temporary supporting struts designed for erection of steel stair components before installation of masonry.
4. Metal Pan Risers, Subtreads, and Subplatforms: Shape metal pans for risers and subtreads to conform to configuration shown. Provide structural steel sheet for metal pans of minimum thickness of 0.0677 inch, unless otherwise indicated, but not less than that required to support total design loading.
5. Form metal pans of cold-rolled carbon steel sheet unless otherwise indicated.
6. Attach risers and subtreads to stringers by means of brackets made of steel angles or bars. Weld brackets to strings and attach metal pans to brackets by welding, riveting or bolting.
7. Coordinate steel stair work with concrete work specified in Section 03300.

## **2.5 STEEL STAIRS AND RAILINGS:**

1. Basis of Design: Subject to compliance with indicated requirements, provide metal stair and railings as manufactured by American Stair Corp. Inc.; Pacific Stair Corp., EeStairs; or approved equal.
2. Provide subplatforms of configuration and construction indicated, or if not indicated, of same metal as risers and subtreads and in thicknesses required to support design loading. Attach subplatform to platform framing members with welds.
3. Steel Floor Plate Treads and Platforms: Provide raised pattern steel floor plate complying with FS QQ-F-461, Class I. Provide pattern indicated or, if not indicated, as selected from manufacturer's standard patterns.
4. Form treads of 1/4" thick steel floor plate with integral nosing and back edge stiffener. Weld steel supporting brackets to strings and treads to brackets.
  - a. Provide stairs capable of supporting a minimum live load of 100 psi and a concentrated load of 300 psi.
5. Provide steel railings, handrails and guardrails as indicated or selected from manufacturer's available full range of types.
6. Finishes and Colors: As indicated in Section 09900.

## **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 the installation.

### **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**