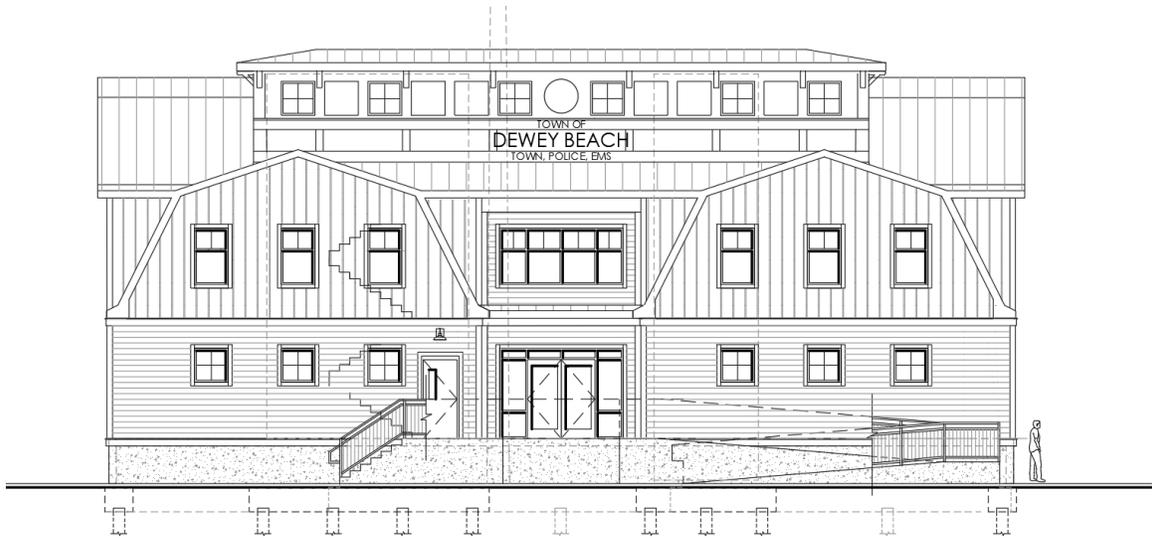




CONFORMED PROJECT MANUAL  
FOR  
**TOWN OF DEWEY BEACH – TOWN HALL + POLICE DEPT**  
DEWEY BEACH, DELAWARE



JANUARY 20, 2025

GMB FILE NO. 220242.A

**GMB**

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# **DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

## **SECTION 00 11 16**

### **INVITATION TO BID**

You are invited to bid on a General Contract for the construction of a new three story 25,635 GSF Town Hall, Police Department, and EMS Quarters in Dewey Beach, Delaware. The new building shall contain reception and waiting spaces, administrative offices, work areas, dispatch, interview rooms, processing and holding cells, evidence room, armory, locker rooms, court and judge office, multipurpose room, conference rooms, EMS quarters, bunk room, and associated facilities. The completed work shall include site work, utilities (domestic, sanitary, electricity, data), concrete, metal roofing, steel studs and drywall, mechanical, electrical, plumbing, fire protection, and security and IT systems. This project involves the construction of a commercial building located in FEMA Flood Zone AE with a base flood elevation (BFE) of 5 feet, with additional 3 feet of freeboard above BFE. Conformance of FEMA provisions and certificates with NFIP shall be followed.

The work will be divided into two phases. The first phase will consist of the construction of the new town hall and police department on the portion of the existing town hall property fronting Coastal Highway. The second phase will consist of transferring occupancy from the existing town hall to new town hall with subsequent demolition of the existing town hall, and construction of the new EMS quarters and sallyports wing. The Contractor shall provide all necessary labor, equipment, tools, materials and incidentals, and shall perform all operations required to completely finish all of the work in the manner approved by the Architect.

The existing Town Hall is critical to the continuous and uninterrupted functionality of the police department and its operations must be maintained throughout the construction period. The General Contractor shall be responsible for providing safe and secure access for staff and visitors to the Town Hall and maintaining connection of all utilities serving the Town Hall. Utility shut offs or temporary outages must be coordinated with necessary staff at least one month in advance of any outage.

Bidders shall, at time of bid, present demonstrated evidence of ability, qualifications and experience in successfully completing one or more construction projects within the last five (5) years. Projects of similar size, type, and complexity as a Town Hall, Police Station, and EMS are preferred, but not required. Referenced projects shall specify the initial bid value, initial contract value, number of change orders, and final contract value. Qualifications shall include a description of the background and experience of the firm, demonstrating the firm's ability to undertake and complete this project successfully. Additionally, Bidders shall provide a list of references from contracts of

similar size, scope and complexity. Provide contract information including name, organization, address, phone number, and email address.”

By submitting their bid, Bidders are certifying they are knowledgeable and experienced in the construction of state-of-the-art municipal facilities of this type and size. Contractor’s will submit one bid on two contracts, provided the phasing requirements of this project. At this time prevailing wages apply to the entire project.

Bidders shall include an executed AIA A305 Contractor’s Qualification Statement, including financial data, and a letter from the Bidder’s bonding company stating the firm’s total bonding limits and its anticipated bonding obligations at the time of bidding this project.

Subcontractors shall be qualified and experienced in projects of similar size, type and complexity as this one, and shall be subject, if requested by the Owner, to submit evidence of same prior to execution of the construction contract.

The Owner has elected to engage the services of a select group of specialist vendor/subcontractors which are named in the bid documents. The General Contractor shall be required to enter into exclusive subcontracts with the named firms for the services designated, while fully cooperating with Owner’s separate contractors.

Bids must be on a lump sum basis and may not be withdrawn for 60 days.

**A pre-bid meeting will be held on-site at 10:00 AM, Tuesday, December 3rd, 2024.** Attendance by General Contractors intending to submit a bid is recommended, but not mandatory. Bidders may visit the site at their own discretion. By submitting their bid, Bidders acknowledge they have examined the site and bid documents in sufficient detail and familiarized themselves adequately to prepare a complete and responsible bid for the specified work. No claims will be approved during construction for items that can be reasonably verified by field examination.

**Written questions will be addressed via Addenda. Last day to receive questions shall be until 5:00 PM, December 20th, 2024.** Questions shall be emailed to George, Miles & Buhr, LLC (GMB), Attn: Deane Townsend, AIA, at [dtownsend@gmbnet.com](mailto:dtownsend@gmbnet.com). Questions shall include the project name in subject heading. Verbal inquiries will not be responded to.

**Sealed bids will be physically received by GMB until 2:00 PM local time on Tuesday January 7<sup>th</sup>, 2025 at Dewey Beach Life Saving Station at 1 Dagsworthy Ave Dewey Beach, DE 19971.** Physical bids received after this time will not be accepted. Bids will be opened and read publicly, and bidders will be notified of the results of the bid at a later date.

Bidders may purchase full set copies of the drawings and specifications from DiCarlo

Printing 2006 Northwood Drive, Salisbury, MD (410-749-0112) for a sum determined by the printer. In lieu of hard copy, bidders may purchase digital copies of the bid documents from the printer at their choice. Partial sets will not be sold.

***DiCarlo Printing will issue all addenda and maintain a plan holder list of firms who have purchased drawings and specifications.***

Bidders must be registered to perform work in the State of Delaware and within the Town of Dewey Beach, and shall include their license number on the Bid Form.

Bid Security in the amount of ten (10) percent of the Bid must accompany each bid in accordance with the Instructions to Bidders. The successful Bidder's security will be retained until it has signed the Contract and furnished a Performance Bond and a Payment Bond AIA Document A312, each in the amount of the contract sum.

The Town of Dewey Beach reserves the right to reject any and all bids, to waive any informality in bids received, and to accept or reject any items of any bid.

**END OF SECTION**

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 00 21 13**

**AIA DOCUMENT A701-2017  
INSTRUCTIONS TO BIDDERS**

Bidders shall comply with the requirements of the above document. Submitting a bid denotes acknowledgement by the Bidder that he has read and understands the content of this document.

**END OF SECTION**

# DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

## SECTION 00 22 13

### SUPPLEMENTARY INSTRUCTIONS TO BIDDERS AIA DOCUMENT A701

Supplementary Instructions contain changes and additions to AIA Document A701 2018 Edition. Where any part of the INSTRUCTIONS TO BIDDERS are modified or voided by the Supplementary Instructions, the unaltered provisions remain in effect.

#### MODIFICATIONS

#### ARTICLE 2 - BIDDER'S REPRESENTATION

2.1 Add the following subparagraph to Paragraph 2.1:

2.1.7: This bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid with any other Bidder or with any competitor.

#### ARTICLE 3 - BIDDING DOCUMENTS

##### 3.1 COPIES

Delete Paragraphs 3.1.1 and 3.1.2 and substitute the following:

3.1.1: Bidders and Sub-bidders may purchase complete sets only of the Bidding Documents from the issuing office designated in the Invitation to Bid for a sum determined by the issuing office. The purchase sum is not refundable.

##### 3.3 SUBSTITUTIONS

Delete Paragraphs 3.3.2.2 and 3.3.2.3 and substitute the following:

3.3.2.2: All requests for substitution prior to receipt of Bids shall be submitted on this attached "SUBSTITUTION REQUEST FORM, DOCUMENT 00 26 00".

#### ARTICLE 4 - BIDDING PROCEDURES

##### 4.1 PREPARATION OF BIDS

Add the following sentence to Subparagraph 4.1.1:

Only one copy of the Bid is to be submitted.

## **4.2 BID SECURITY**

Add the following subparagraph to Paragraph 4.2:

4.2.5: If a Bidder refuses to execute the Agreement and obtain the performance and payment bonds within the agreed time, the Owner may consider the Bidder in default, in which case the Bid Bond accompanying the Bid shall become the property of the Owner.

## **4.4 MODIFICATION OR WITHDRAWAL OF BIDS**

Delete Subparagraph 4.4.1 and substitute the following:

4.4.1 No Bidder may withdraw, modify or cancel, a Bid within 60 calendar days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

Add the following wording to the end of Subparagraph 4.4.3:

The bid security shall be returned to the Bidder.

## **ARTICLE 5 - CONSIDERATION OF BIDS**

### **5.3 ACCEPTANCE OF BID (AWARD)**

Delete Subparagraph 5.3.2 and substitute the following:

5.3.2 The Owner shall have the right to accept Alternates in the sequence or combinations listed and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates accepted.

**END OF SECTION**

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 00 41 13**

**BID FORM**

TO:

TOWN OF DEWEY BEACH  
105 RODNEY AVENUE  
DEWEY BEACH, DELAWARE

NEW DEWEY BEACH TOWN  
HALL AND POLICE DEPT.

I have received the construction documents titled New Construction for Dewey Town Hall and Police Department. I have also received Addenda Nos. \_\_\_\_\_, and have included their provisions in this Proposal. I have examined both the documents and the site and submit the following bid.

In submitting this bid, I agree:

1. To hold my bid open until 60 days after bids are opened.
2. To enter into and execute a Contract, if awarded on the basis of this bid, and to furnish Performance and Labor and Material Payment Bonds in accord with the Supplementary Instructions to AIA Document A701.
3. To accomplish the work in accord with the Contract Documents.
4. To complete the work as certified in writing by the architect within \_\_\_\_\_ calendar days following receipt of written notice to proceed.

The first phase of construction will take \_\_\_\_\_ calendar days

The second phase of construction will take \_\_\_\_\_ calendar days.

\_\_\_\_\_ will construct this project for the lump sum price of:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_)

The first phase of construction with **prevailing wage** rate will cost:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_)

The second phase of construction with prevailing wage rate will cost:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_)

Included within the lump sum price is \$ \_\_\_\_\_ for the full payment & performance bond premium in the amount of 100% of the lump sum price stated on this bid form.

I include a copy of my current Delaware Contractor's license, Town of Dewey Contractor License, and other local licenses if applicable, with my bid. Subcontractor's entered into this contract with trades identified by the Delaware Division of Professional Regulation—including but not limited to Electricians, Elevator Mechanics, HVAC, Plumbers, Surveyors, etc.—shall possess professional licenses by the Delaware Division of Professional Regulation.

I include an executed copy of AIA Document A305 "Contractor's Qualification Statement" with my bid.

I include the required Bid Security with my bid.

I include the following DEDUCTIVE ALTERNATES. The Town of Dewey Beach reserves the right to incorporate alternates, in part or in total, it deems to be in its own best interests.

**ALTERNATE NO. 1:** Omit terrazzo flooring, and substitute with LVT flooring #2.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 2:** Omit drywall, furring, acoustical batt insulation for wall types A and B. Embed conduit, power, or other utility within the wall. Finish exposed concrete with primer and paint as specified.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 3:** Omit all LVT and Carpet where scheduled, and substitute for sealed and polished concrete.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 4:** Substitute standing seam metal roof for fully adhered pvc membrane roof with standing seam profile.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 5:** Omit all windows on the third floor. Block and rough-in framing for future window install.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 6:** Omit all ceramic tile. Provide rigid vinyl wall protection system up to 48" A.F.F. over painted moisture resistant drywall where scheduled, and provide fully adhered LVT flooring with heat welded seams to prevent moisture intrusion.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 7:** Substitute fiberglass doors and frames for hollow metal doors and frames.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 8:** Omit elevator # 2. Provide foundation pit, shaft wall at first floor, and floor block outs for second and third for future install. Provide handicap lift to serve between Grade Vestibule to Processing Vestibule with necessary safeguards, calls, and doors.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 9:** Omit all ballistic (and fire-rated) exterior glass on first floor and substitute with ballistic and fire-rated glass block with frames and mortar.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 10:** The cost to omit prevailing wages from labor for the project from **first phase** of construction.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 11:** The cost to omit prevailing wages from labor for the project from **second phase** of construction.

DEDUCT: \$ \_\_\_\_\_

**ALTERNATE NO. 12:** The cost in savings for construction if phasing was eliminated from the project and both phases (1+2) were constructed all at one time under prevailing wage rate.

DEDUCT: \$ \_\_\_\_\_

**SCHEDULE C- UNIT PRICES BID – CONTINGENT ITEMS**

CONTINGENT ITEMS: The following unit prices will be utilized for changes in work from that indicated by the Project Manual, upon authorization of the Engineer.

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
C1	Excavation Below Subgrade	-- CY	200		
C2	Furnish and Place Gravel Bedding	-- CY	100		
C3	Furnish and Place Special Backfill	-- CY	200		
C4	Miscellaneous Excavation and Backfill	-- CY	100		
C5	Furnish and Place Miscellaneous 4,500 psi Concrete	-- CY	100		
C6	Secure Modified Proctor Tests	-- EA	6		
C7	Secure Field Density Tests	-- EA	20		
C8	Secure Concrete Field Test Cylinders	-- EA	20		

**SUBCONTRACTORS**

Subcontractor’s entered into this contract with trades identified by the Delaware Division of Professional Regulation—including but not limited to Electricians, Elevator Mechanics, HVAC, Plumbers, Surveyors, etc.—shall possess professional licenses by the Delaware Division of Professional Regulation. The undersigned BIDDER proposes to use the following named licensed SUBCONTRACTORS:

SITE WORK \_\_\_\_\_

PAVEMENT \_\_\_\_\_

CONCRETE \_\_\_\_\_

STEEL \_\_\_\_\_

CARPENTRY \_\_\_\_\_

FRAMING \_\_\_\_\_

CABINETRY \_\_\_\_\_

DOORS AND HARDWARE \_\_\_\_\_

WINDOWS \_\_\_\_\_

DRYWALL \_\_\_\_\_

ACOUSTICAL CEILINGS \_\_\_\_\_

FLOORING \_\_\_\_\_

ROOFING \_\_\_\_\_

HVAC \_\_\_\_\_

ELECTRICAL \_\_\_\_\_

PLUMBING \_\_\_\_\_

FIRE PROTECTION \_\_\_\_\_

The following Corporation is chartered in the State of \_\_\_\_\_.

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

CORPORATE SEAL

\_\_\_\_\_  
Firm Name

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Date

\_\_\_\_\_  
Business Address

\_\_\_\_\_  
Delaware Contractor's License #

**END OF SECTION**

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 00 43 13**

**AIA DOCUMENT A310 - 2010  
BID SECURITY FORMS**

Bidders are required to submit an executed AIA DOCUMENT A310 – BID BOND as an attachment to their bid.

**END OF DOCUMENT**

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 00 52 53**

**AIA DOCUMENT A101-2017  
AGREEMENT FORM BETWEEN OWNER-DESIGN AND CONTRACTOR  
– STIPULATED SUM**

The successful bidder shall be required to execute the above named agreement. Submitting a bid denotes acknowledgement by the Bidder that he has read and understands the content of this document as modified in the attached draft contract form.

**END OF DOCUMENT**

 **AIA**® Document A101® – 2017**Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum**

**AGREEMENT** made as of the    day of    in the year 2024  
*(In words, indicate day, month and year.)*

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

The Town of Dewey Beach  
105 Rodney Ave  
Dewey Beach, Delaware 19971

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

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

New Construction For Dewey Town Hall & Police Department  
1505 Coastal Highway  
Dewey Beach, Delaware 19971

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

George, Miles & Buhr, LLC  
206 West Main Street  
Salisbury, MD 21801

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.
- Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

The date of commencement shall be within two (2) weeks after the Contractor receives: All associated Building Permits; a fully executed agreement; a written notice to proceed; evidence and verification of mutually acceptable construction financing; and beneficial use of the building site, whichever is the later.

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

**§ 3.2** The Contract Time shall be measured from the date of commencement of the Work. Contractor shall submit within two weeks of execution of this Agreement a Schedule for the Work in conformance with Section 3.10.1 of AIA A201-2017 for the Owner’s review and approval.

**§ 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.)*

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

[ ] By the following date:

**§ 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
Not Applicable	

**§ 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 Eight Hundred Seventy-Three Thousand, Six Hundred (\$ 873,600.00 ), 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
Not Applicable	

**§ 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
Not Applicable		

**§ 4.3** Allowances, if any, included in the Contract Sum:

*(Identify each allowance.)*

Item	Price
Not Applicable	

**§ 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)
See Attachment G		

**§ 4.5** Liquidated damages, if any:

*(Insert terms and conditions for liquidated damages, if any.)*

Not Applicable

**§ 4.6** Other:

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

Contractor shall receive no more than a ten percent (10%) markup for overhead and profit on Owner approved additional scope change orders

## **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 1st day of a month, and the Architect certifies the application for payment in accordance with AIA A201-2017, Article 9, the Owner shall make payment of the amount certified to the Contractor not later than the 21st day of the same month. If a complete Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than twenty-one ( 21 ) days after the Architect certifies the Application for Payment and the Owner approves the same application.

(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 and in detail as reasonably required by the Owner. 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, unless reasonably objected to by the Owner, 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 and that Owner has approved.

**§ 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.

§ 5.1.6.3 Notwithstanding anything contained in the Contract Documents to the contrary, the Contractor shall not be entitled to any progress payment for any Work performed unless the Owner shall have received when due, and approved, the following:

- .1 Insurance certificates, as required by the Contract Documents; and
- .2 Appropriate waiver of liens from the Contractor and all tier-subcontractors and suppliers from previous Owner paid Applications for Payment.

### § 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.)*

10.0%

§ 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.)*

Not Applicable

§ 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.)*

Upon Owner's acceptance of Substantial Completion of the entire work, the sum of the total payments shall be increased to equal 95% of the Contract Sum, less amounts for incomplete work and unsettled claims.

§ 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.)*

Not Applicable

§ 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.
- .3 only after occurrence of all of the events described below:
  - (i) Acceptance of the Work by the Owner as fully performed under the Contract Documents;
  - (ii) Written assignment to the Owner by Contractor and all Subcontractors and supplies or material and equipment of all warranties and guaranties in the form provided by Owner;
  - (iii) Delivery by the Contractor of three (3) copies of any owners, operation or maintenance manual issued by any manufacturer and/or supplier;
  - (iv) Delivery by the Contractor of electronic and paper copies of the Project Record drawing relined showing all changes;

Init.

- (v) Delivery by the Contractor of conditional written releases of all liens and/or requests to file mechanics', material-men's and like liens against the Project, signed by Contractor and each Subcontractor and material-man that performed labor or furnished materials in connection with the Work. If any Subcontractor or material or equipment supplier refuses to furnish a release or waiver, the Contractor shall furnish a bond satisfactory to Owner to indemnify it against such possible lien;
- (vi) Delivery by the Contractor of all deliverables as specified in the Project Specifications and Contract Documents; and
- (vii) If required by the Owner, delivery by the Contractor of other data establishing payment or satisfaction of all such obligations.

§ 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.)*

6 % per year

**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.

*(Paragraphs deleted)*

**§ 6.2 Binding Dispute Resolution**

For any unresolved , case, controversy, or dispute between the Owner and Contractor arising out of or related to this Agreement or breach thereof, remaining after an attempt to resolve the dispute by the parties through AIA 201-2017, Article 15.1 and 15.2, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

- Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- Litigation in a court of competent jurisdiction
- 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.)*

Payment for work completed as certified in writing by the Architect

Init.

§ 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.

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

The Town of Dewey Beach  
105 Rodney Ave  
Dewey Beach, Delaware 19971  
Bill Zolper, Town Manager  
302.227.6363

§ 8.3 The Contractor’s representative:  
*(Name, address, email address, and other information)*

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

### § 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents. The Owner, Owner’s lender, together with their officers, directors, employees and agents shall be named Additional Insureds. The Contractor’s insurance shall be primary for all claims arising from or related to the acts of negligence of Contractor and its subcontractors.

§ 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.)*

Not Applicable

§ 8.7 Other provisions:

§ 8.7.1 The parties agree that this Agreement may be executed in counterparts and that electronic and facsimile copies of this Agreement, including the signatures, shall constitute and considered original.

## ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

Init.

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. “The American Institute of Architects,” “American Institute of Architects,” “AIA,” the AIA Logo, and “AIA Contract Documents” are trademarks of The American Institute of Architects. This document was produced at 13:42:41 ET on 11/14/2024 under Order No.3104239933 which expires on 02/13/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiaccontracts.com.

User Notes:

(1211263791)

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A201™–2017, General Conditions of the Contract for Construction
- (Paragraphs deleted)
- .3 Drawings

Number	Title	Date
Attachment B	New Construction For: Dewey Beach Town Hall & Police Department	

- .4 Specifications

Section	Title	Date	Pages
Attachment C	Project Manual		

- .5 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.

(Paragraphs deleted)

- .6 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.)*

- ATTACHMENT D – Project Schedule (To be provided after contract executions and to be as approved by Owner)
- ATTACHMENT E – Sample Certificate of Liability Insurance
- ATTACHMENT F – Bond Requirements
- ATTACHMENT G – Unit Price Schedule

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)

Bill Zolper, Town Manager  
The Town of Dewey Beach

Init.

User Notes:

# Additions and Deletions Report for AIA® Document A101® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 13:42:41 ET on 11/14/2024.

## PAGE 1

**AGREEMENT** made as of the    day of    in the year 2024

...

The Town of Dewey Beach  
105 Rodney Ave  
Dewey Beach, Delaware 19971

...

New Construction For Dewey Town Hall & Police Department  
1505 Coastal Highway  
Dewey Beach, Delaware 19971

...

George, Miles & Buhr, LLC  
206 West Main Street  
Salisbury, MD 21801

## PAGE 2

Established as follows:

...

The date of commencement shall be within two (2) weeks after the Contractor receives: All associated Building Permits; a fully executed agreement; a written notice to proceed; evidence and verification of mutually acceptable construction financing; and beneficial use of the building site, whichever is the later.

...

**§ 3.2** The Contract Time shall be measured from the date of commencement of the Work. Contractor shall submit within two weeks of execution of this Agreement a Schedule for the Work in conformance with Section 3.10.1 of AIA A201-2017 for the Owner's review and approval.

## PAGE 3

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

...

Not Applicable

...

§ 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 Eight Hundred Seventy-Three Thousand, Six Hundred (\$ 873,600.00 ), subject to additions and deductions as provided in the Contract Documents.

...

Not Applicable

...

Not Applicable

...

Not Applicable

...

See Attachment G

...

Not Applicable

**PAGE 4**

Contractor shall receive no more than a ten percent (10%) markup for overhead and profit on Owner approved additional scope change orders

...

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 1st day of a month, and the Architect certifies the application for payment in accordance with AIA A201-2017, Article 9, the Owner shall make payment of the amount certified to the Contractor not later than the 21st day of the same month. If ~~an~~ a complete Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than (—) days after the Architect receives the Application for Payment. ~~twenty-one ( 21 ) days after the Architect certifies the Application for Payment and the Owner approves the same application.~~

...

§ 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~~. Documents and in detail as reasonably required by the Owner. 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-values~~, unless reasonably objected to by the Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment.

...

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be ~~reasonably justified~~. justified and that Owner has approved.

**PAGE 5**

§ 5.1.6.3 Notwithstanding anything contained in the Contract Documents to the contrary, the Contractor shall not be entitled to any progress payment for any Work performed unless the Owner shall have received when due, and approved, the following:

- .1 Insurance certificates, as required by the Contract Documents; and
- .2 Appropriate waiver of liens from the Contractor and all tier-subcontractors and suppliers from previous Owner paid Applications for Payment.

...

10.0%

...

Not Applicable

...

Upon Owner’s acceptance of Substantial Completion of the entire work, the sum of the total payments shall be increased to equal 95% of the Contract Sum, less amounts for incomplete work and unsettled claims.

...

Not Applicable

...

- .3 only after occurrence of all of the events described below:
  - (i) Acceptance of the Work by the Owner as fully performed under the Contract Documents;
  - (ii) Written assignment to the Owner by Contractor and all Subcontractors and supplies or material and equipment of all warranties and guaranties in the form provided by Owner;
  - (iii) Delivery by the Contractor of three (3) copies of any owners, operation or maintenance manual issued by any manufacturer and/or supplier;
  - (iv) Delivery by the Contractor of electronic and paper copies of the Project Record drawing relined showing all changes;
  - (v) Delivery by the Contractor of conditional written releases of all liens and/or requests to file mechanics’, material-men’s and like liens against the Project, signed by Contractor and each Subcontractor and material-man that performed labor or furnished materials in connection with the Work. If any Subcontractor or material or equipment supplier refuses to furnish a release or waiver, the Contractor shall furnish a bond satisfactory to Owner to indemnify it against such possible lien;
  - (vi) Delivery by the Contractor of all deliverables as specified in the Project Specifications and Contract Documents; and
  - (vii) If required by the Owner, delivery by the Contractor of other data establishing payment or satisfaction of all such obligations.

**PAGE 6**

6 % per year

...

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, 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.)*

...

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201-2017, unresolved, case, controversy, or dispute between the Owner and Contractor arising out of or related to this Agreement or breach thereof, remaining after an attempt to resolve the dispute by the parties through AIA 201-2017, Article 15.1 and 15.2, the method of binding dispute resolution shall be as follows:

...

Litigation in a court of competent jurisdiction

...

Payment for work completed as certified in writing by the Architect  
**PAGE 7**

The Town of Dewey Beach  
105 Rodney Ave  
Dewey Beach, Delaware 19971  
Bill Zolper, Town Manager  
302.227.6363

...

§ 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. The Owner, Owner's lender, together with their officers, directors, employees and agents shall be named Additional Insureds. The Contractor's insurance shall be primary for all claims arising from or related to the acts of negligence of Contractor and its subcontractors.

...

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with ~~a building information modeling exhibit, 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 ~~a building information modeling exhibit, 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.)*

Not Applicable

...

§ 8.7.1 The parties agree that this Agreement may be executed in counterparts and that electronic and facsimile copies of this Agreement, including the signatures, shall constitute and considered original.

**PAGE 8**

- ~~2~~ AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- ~~3~~ AIA Document A201™-2017, General Conditions of the Contract for Construction
- ~~4~~ Building information modeling exhibit, dated as indicated below:  
*(Insert the date of the building information modeling exhibit incorporated into this Agreement.)*

.5 — 3 Drawings

...

Attachment B

New Construction For:  
Dewey Beach Town Hall  
& Police Department

.6 — 4 Specifications

...

Attachment C

Project Manual

.7 — 5 Addenda, if any:

...

...

.8 — Other Exhibits:

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

— AIA Document E204™ 2017, Sustainable Projects Exhibit, dated as indicated below:  
*(Insert the date of the E204 2017 incorporated into this Agreement.)*

\_\_\_\_\_

— The Sustainability Plan:

**Title**

**Date**

**Pages**

— Supplementary and other Conditions of the Contract:

**Document**

**Title**

**Date**

**Pages**

.9 — 6 Other documents, if any, listed below:

...

ATTACHMENT D – Project Schedule (To be provided after contract executions and to be as approved by Owner)

ATTACHMENT E – Sample Certificate of Liability Insurance

ATTACHMENT F – Bond Requirements

ATTACHMENT G – Unit Price Schedule

...



## **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, Morgan H. Helfrich, AIA, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:42:41 ET on 11/14/2024 under Order No. 3104239933 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, other than those additions and deletions shown in the associated Additions and Deletions Report.

---

*(Signed)*

---

*(Title)*

---

*(Dated)*

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 00 61 13**

**AIA DOCUMENT A312 - 2010  
PERFORMANCE BOND AND PAYMENT BOND**

The successful bidder shall be required to execute the above named bonds as a requirement of the contract.

**END OF DOCUMENT**

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 00 72 00**

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

The successful bidder shall be required to execute his contract according to the requirements of the above named document. Submitting a bid denotes acknowledgement by the Bidder that he has read and understands the content of this document as modified in the attached draft contract form.

**END OF SECTION**



# AIA® Document A201® – 2017

## General Conditions of the Contract for Construction

**for the following PROJECT:**

*(Name and location or address)*

New Construction For: Dewey Beach Town Hall & Police Department  
1505 Coastal Highway  
Dewey Beach, Delaware 19975

**THE OWNER:**

*(Name, legal status and address)*

The Town of Dewey Beach  
105 Rodney Ave  
Dewey Beach, Delaware 19975

**THE ARCHITECT:**

*(Name, legal status and address)*

George, Miles & Buhr, LLC  
206 West Main Street  
Salisbury, MD 21801

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- 5 SUBCONTRACTORS
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- 11 INSURANCE AND BONDS
- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS

**ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

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## **ARTICLE 1 GENERAL PROVISIONS**

### **§ 1.1 Basic Definitions**

#### **§ 1.1.1 The Contract Documents**

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

#### **§ 1.1.2 The Contract**

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

#### **§ 1.1.3 The Work**

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

#### **§ 1.1.4 The Project**

The Project is the total construction described in the Agreement 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, including electronic versions of the foregoing.

#### **§ 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, including electronic versions of the foregoing.

#### **§ 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

Init.

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to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. Contractor warrants and represents to Owner that, as of execution of this Contract, Contractor is not aware of any conflict or inconsistency in or among the Contract Documents, or between the Contract Documents and applicable codes in effect. The parties acknowledge and agree that the Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, nor is the Contractor responsible for the overall design of the Project. In the event of a conflict or an inconsistency in or among the Contract Documents, or between the Contract Documents and applicable codes in effect at the time the Contract Sum is bid or negotiated, the Contractor shall give written notice to the Owner and the Architect within ten (10) days of discovering any of the above-referenced conflicts. This written notice will be in the form of a request for information or other similar notice acceptable to the Owner. Any field directives should be documented in writing and retained by the Contractor for the Owner's later review.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract. The Contractor shall be responsible for coordinating his own work with all the contract drawings and other trades affecting his work. A claim of limitation of responsibility by the contractor due to the failure to do such coordination is not acceptable.

**§ 1.2.1.2** The Contractor shall be responsible for coordinating his own work with all the contract drawings and other trades affecting his work. A claim of limitation of responsibility by the contractor due to the failure to do such coordination is not acceptable.

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

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

### **§ 1.3 Capitalization**

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

### **§ 1.4 Interpretation**

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

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

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

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

## § 1.6 Notice

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

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 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

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, 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 in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

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

### § 2.3 Information and Services Required of the Owner

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

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

§ 2.3.3 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.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner insofar as the information is solely within the knowledge of the Owner and cannot be verified by the Contractor through any other source, and the Contractor shall exercise proper precautions relating to the safe performance of the Work.

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

§ 2.3.6 The Contractor will provide its Subcontractors with the Contract Documents. The Owner shall provide Contractor with a complete electronic version of all the Contract Documents upon execution of this contract.

### § 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 warranty that the Contractor has visited the site, evaluated the site, and identified any limitations upon the Work or special requirements, the anticipated labor supply needed and its cost, and the availability and cost of materials, tools, and equipment, and correlated personal observations with requirements of the Contract Documents. The Contractor represents that the work to be performed on the job site will comply with all applicable laws, rules, ordinances, and regulations. Notwithstanding the foregoing sentence, the parties acknowledge and agree that the Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, nor is the Contractor responsible for the overall design of the Project. Contractor shall be fairly compensated for additional work above that which is shown within the Contract Documents that may be required to comply with applicable laws, statutes, ordinances, building codes, and rules and regulations.

**§ 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 and Owner 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. Execution of the Contract by the Contractor is also a representation and warranty that the Contractor has carefully reviewed the Contract Documents, they are complete and sufficient to enable it to perform the Work and fulfill its obligations to complete the Work as depicted and defined by the Contract Documents, and the Contractor has no knowledge of any discrepancies, omissions, or conflicts within the Contract Documents. The Contractor agrees to immediately notify in writing the Owner and the Architect if it becomes aware of any such discrepancies, omissions, or conflicts. This notification should be in the form of a request for information, or similar written notice acceptable 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 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.

§ 3.2.5 The Contractor shall give the Architect timely notice of any known additional Drawings, Specifications or instructions required to define the Work in greater detail, or to permit the proper progress of the Work. The Architect shall respond to such notices in a timely manner. The Contractor shall not knowingly proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional Drawings, Specifications or instructions from the Architect. If the Contractor knowingly proceeds with such Work without obtaining further Drawings, Specifications or instructions, the Contractor shall correct Work incorrectly done at the Contractor's own expense. If the Contractor fails to correct this Work, the Owner may elect to have the Work performed by itself or another entity, and deduct from the Contract Sum the cost of such Work

### § 3.3 Supervision and Construction Procedures

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

§ 3.3.2 Neither the Contractor shall nor its employees shall be deemed to be employees of the Owner, but shall act as independent contractors. Nothing in the Contract shall be construed as authority for the Contractor to make commitments that shall bind the Owner, or otherwise act on behalf of the Owner, except as the Owner may expressly authorize in writing. 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 The Contractor shall develop procedures acceptable to the Owner for implementing, documenting, reviewing and processing field questions and responses, field variance authorizations and directives, minor changes and Change Orders. The Contractor shall review requests for changes submitted by the Subcontractors, negotiate Subcontractor's proposal, submit recommendations to the Owner and, if they are accepted by the Owner in writing, prepare and submit Change Orders for the approval and signature of the Owner. All requests for information by the Contractor or any Subcontractor shall be submitted in good faith and shall contain the Contractor's or the Subcontractor's, as applicable, proposed answer to the request. If the Contractor proposes a substitution from materials or equipment specified in the Contract Documents, then, if such substituted material or equipment is accepted by the Owner, the Contractor shall pay for any redesign or reengineering costs incurred to accommodate the substitution.

§ 3.3.5 If any of the Work performed by Contractor is required to be inspected or approved by any public authority, then the Contractor shall cause such inspection or approval to be performed. No inspection performed or failed to be performed by the Owner hereunder shall be a waiver of any of the Contractor's obligations hereunder or be construed as an approval or acceptance of the Work or any part thereof.

§ 3.3.6 The Contractor acknowledges that it is the Contractor's responsibility to hire all personnel for the proper and diligent prosecution of the Work. The Contractor shall use its best efforts to maintain labor peace for the duration of the Project.

### § 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.

§ 3.4.3 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.

### § 3.6 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. The Owner is a municipal corporation and will provide the Contractor with a tax-exempt certificate.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

*(Paragraphs deleted)*

### § 3.7.4 Unforeseen, 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.

**§ 3.7.6 Claims for Additional Cost.** If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Such notice shall include, to the extent then known by the Contractor, full details and substantiating data to permit evaluation by the Owner and the Architect. If further or other information subsequently becomes known to the Contractor, it shall immediately be furnished to the Owner and the Architect in writing. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

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

**§ 3.9.2** 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 updated monthly. The Contractor shall submit progress reports to the Owner and Architect on a monthly basis indicating whether the work is on schedule and provided a two-week "look ahead" for upcoming tasks. The schedule shall be maintained in Microsoft Project and the schedule, schedule revisions and progress reports shall be provided to the Owner and Architect in electronic .pdf and MS Project formats.

**§ 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 Contractor shall keep accurate and detailed written records of the progress of the Work and shall submit monthly written progress reports to the Owner, including, but not limited to, information concerning the Work of each Subcontractor, the percentage of completion, Requests for Information ("RFIs"), the status of RFIs, the schedule and the number and amount of Change Orders. The Contractor shall also provide the required and actual staffing requirements necessary to complete the Work within the approved Project schedule. The format of the Contractor's monthly construction reports shall be approved by the Owner, which approval will not be unreasonably withheld. Delivery of a monthly progress report shall be a condition precedent to the Owner's obligation to make payment to the Contractor. The Contractor shall notify the Owner in writing of any causes for and corrective action to any deviations to the approved Project schedule. The Contractor shall maintain at the Project site, on a current basis, records of all documents, including Shop Drawings, Samples, and Product Data.

### **§ 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. Samples, purchase orders, subcontracts, materials, equipment, applicable handbooks, commercial and technical standards and specifications, and any other related documents and revisions that arise out of the Contract Documents or the Work, all of which shall be the property of the Owner. The Contractor shall keep full and complete open book records at the Contractor's office and shall provide the records in total to the Owner upon completion of the Work and prior to the Contractor receiving final payment. 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. The Contractor shall stamp all Shop Drawings, Product Data, Samples and other submittals to verify the Contractor's review and approval thereof, which stamp shall constitute a representation by the Contractor to the Owner that the submitted item conforms with the Contract Documents and is coordinated with other related Work. In collaboration with the Architect, the Contractor shall establish and implement procedures for expediting the processing and approval of Shop Drawings, Product Data, Samples and other submittals.

**§ 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.

§ 3.12.11 The Contractor shall assemble for the Architect's approval three (3) complete copies in loose leaf binders, in the manner required by the Specifications, of all operating and maintenance data from all manufacturers whose equipment is or will be installed in the Work.

### § 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall confine his work to the 'Limit of Construction'. It shall not obstruct public roads by delivery or other vehicles and shall work out material storage areas, vehicular access and work crew parking.

§ 3.13.2 The Contractor shall confine his work to the 'Limit of Construction'. He shall not obstruct public roads by delivery or other vehicles and shall work out material storage areas, vehicular access and work crew parking.

### § 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 in a clean and safe condition, 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 The Contractor shall defend any and all suits brought against the Owner, and its representatives, offices, agents, and employees by any employee or other person (whether employed by the Contractor or not) for damage to property and/or injury to persons (including death) alleged or claimed to have been caused by or through the performance by the Contractor or the Work, including work required by Article "guarantees," or the condition of the

site, and shall indemnify and hold harmless the Owner, and its representatives, officers and agents, and employees of each of them from and against any and all claim or claims arising out of the work performed by the Contractor or the conditions of the site, and whether or not such claim or claims are based in whole or in part on the negligence or contributory negligence of any one or more of them; the Contractor shall pay, liquidate, and discharge any and all claims or demands for personal injury (including death), and for loss or damage to any and all property caused by, growing out of or incidental to the performance of the work by the Contractor or the condition of the site, including, without the foregoing thereto, damage to the work and other property of the Owner, and including all other damages and all costs and expenses of suits and reasonable attorneys' fees. The obligations set forth in this Article shall, but not by way of limitations, specifically include all claims and judgments arising or alleged to arise with respect to the Protection of Adjacent Land Owners. In the event of any such injury (including death) or loss or damage (or claim or claims therefore), the Contractor shall give immediate notice thereof to the Owner.

**§ 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.

## **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. The term "Architect" means the Architect or the Architect's authorized representative.

**§ 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, or otherwise with the Owner's concurrence from time to time during the one-year warranty period. The Architect will advise and consult with the Owner. 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, and to keep the Owner informed about, the progress and quality of the portion of the Work completed, to endeavor to guard the Owner against defects and deficiencies in the Work, 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, but Owner's failure to do so shall not constitute a default under this Agreement. Communications by and with the Architect's consultants shall be

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through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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

§ 4.2.6 The Architect and Owner has the authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect and Owner 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.

## 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, as soon as practicable 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 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 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 Approval of Subcontractors. The Bid Form requires that the Contractor shall state the name of certain major subcontractors whom he proposes to employ. The Contractor shall be required to actually enter a subcontract with the subcontractors named in his proposal for these major divisions of the work, except those against whom the Architect or Owner shall have reasonable objection before the execution of the Contract. Subcontractors shall furnish suitable evidence of qualifications, experience, references and financial background, when requested by the Owner, to assist the Owner in its evaluation if such question should arise.

### § 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 Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. 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.

§ 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. The Owner shall not be obligated to pay for any Changes in the Work not evidenced by a written Change Order or Construction Change Directive.

§ 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.

§ 7.1.4 All Change Orders shall be executed in writing and signed by the Owner, Contractor and Architect, and shall contain full particulars of the changes, and, as applicable, any adjustments to the Contract Sum, date of Substantial Completion or any other modification to the Contract. No changes to the scope of Work, date of Substantial Completion or Contract Sum shall be made except in accordance with a duly issued Change Order executed by both parties authorizing such changes. Except in the event of an emergency involving imminent threat of bodily injury or property damage, the Contractor shall neither seek, nor be entitled to receive, payment for any extra or additional work, unless the Contractor receives, prior to performing such work, a written direction to proceed with such extra or additional work, signed by an authorized agent of the Owner. The parties will promptly review and expedite Change Order proposals and shall promptly incorporate into a Change Order any undisputed amounts as to any additional 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.

§ 7.2.2 The Owner's and Contractor's agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum, the Contract Time, and the construction schedule, unless stated otherwise in the Change Order itself. Execution of a Change Order by the Contractor shall be deemed a waiver and release of any right to make a claim for additional time or money for Work to be performed under such Change Order except as otherwise set forth in the Change Order.

**§ 7.2.3** Costs Excluded - The term Cost of the Work shall not include any of the following items:

- .1 Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- .2 Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- .3 Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- .4 Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- .5 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in the work.

### **§ 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.

§ 7.3.7 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.

#### § 7.4 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.

### **§ 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 binding dispute resolution; 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, then the Contract Time shall be extended for such reasonable time as the Architect may determine. To the fullest extent permitted under Maryland law, the Contractor hereby waives any claim for damages by reason of delay not exceeding forty-five (45) days in the commencement, prosecution, or completion of the Work, and agrees that an equitable extension of the date for Substantial Completion shall be the Contractor's sole remedy for any delays, obstructions or interferences. Such adjustments to the Contract Time shall be made by Change Order.

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

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents. Should the Contractor contend that it is entitled to an extension of time for completion of any portion or portions of the Work, it shall, within fifteen (15) days of the occurrence of the cause of the delay, notify the Owner in writing of the existence of the delay, setting forth (a) the cause for the delay, (b) a description of the portion or portions of Work affected thereby, and (c) all details pertinent thereto. If it is impracticable to specify the length of such delay at the time the notice referred to in the preceding sentence is delivered, then the Contractor shall provide the Owner with periodic (not less than weekly) supplemental notices during the period over which the event continues. Such supplemental notices shall keep the Owner informed of any change, development, progress or other relevant information concerning the event of which the Contractor is aware. It is a condition precedent to the consideration or prosecution of any Claim for extension time that the foregoing procedures be strictly adhered to in such instance, and if the Contractor fails to comply in all material respects, then the Contractor shall be deemed to have waived such Claim. Within fifteen (15) days after the expiration of any such delay, the Contractor shall deliver to the Owner a subsequent written application for the specific number of days of extension of time requested, which, if accepted by the Owner, shall be memorialized in a Change Order. No extension of time shall be granted to the Contractor to the extent that, notwithstanding the existence of any circumstance beyond the Contractor's control, delay would have resulted from any event due to a concurrent unexcused delay of the Contractor. Except to the extent prohibited by law or granted by the Owner in its sole discretion and in accordance with Section 8.3.4.1, the Contractor agrees that whether or not any delay shall be the basis for an extension of time, it shall have no Claim against the Owner for any increase in the Contract Sum, nor a Claim against the Owner for payment or allowance of any kind of damage, loss or expense resulting from delays, hindrances, obstructions or interferences with the Work, unless such delays were caused by the active interference of the Owner (but not the Architect) in the progress of the Work. Except as otherwise set forth herein, the only remedy available to the Contractor will be an extension of time as permitted pursuant to this Article 8.

**§ 8.3.4** If Contractor is delayed in the performance of the Work due to acts, omissions, conditions, events, or circumstances beyond its control and due to no fault of its own or those for whom Contractor is responsible, then, at Owner's discretion, either (a) the Contract Time(s) for performance shall be reasonably extended by Change Order, or (b) without an extension of the Contract Time(s), additional staffing will be added as needed to complete the Work, and the Contract Price will be reasonably adjusted by Change Order. By way of example, events that will entitle Contractor to an extension of the Contract Time(s) include acts or omissions of Owner or anyone under Owner's control (including separate contractors), changes in the Work, Differing Site Conditions, Hazardous Conditions, and Force Majeure Events. An adjustment as described in clause (a) or (b) above will be Contractor's sole remedy for any delay described in this Section 8.3.

## **ARTICLE 9 PAYMENTS AND COMPLETION**

### **§ 9.1 Contract Sum**

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

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

## § 9.2 Schedule of Values

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

## § 9.3 Applications for Payment

§ 9.3.1 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. Each Application for Payment shall be certified as correct by the Contractor and shall be accompanied by an AIA G702 and G703 and waivers of liens from Subcontractors, Sub-subcontractors, materialmen and suppliers, and such other documentation as is required by the Specifications or other Contract Documents.

§ 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.

§ 9.3.1.3 Progress Payments will be 90% monthly and will cover the period up to the first day of each month and are to include payment for stored materials and equipment. Payment for stored materials shall be made only for materials: (i) stored on site or in a bonded warehouse, and (ii) for which title has been irrevocably assigned to Owner.

§ 9.3.1.4 In applying for payments, excluding the first payment and the final payment, the Contractor shall submit a written certificate in the exact wording that he has paid:

- .1 Labor to date.
- .2 Vendors and material suppliers in full to include items included in his previous statement and for which he received payment from the Owner.
- .3 Subcontractors in full, less the related 10%, to the amount included in his previous statement and for which he received payment from the Owner.

Contractor shall submit partial lien releases for work performed or materials provided by his subcontractors when work is complete and when requested by the Architect.

§ 9.3.1.5 Upon acceptance of Substantial Completion of the entire work, the sum of the total payments shall be increased to equal 95% of the Contract Sum, less amounts for incomplete work and unsettled claims.

§ 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.

**§ 9.3.3** 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. The Contractor further agrees that receipt of payment for any Application for Payment shall conclusively be deemed to waive all liens with respect to said Work to which the Contractor may then be entitled.

#### **§ 9.4 Certificates for Payment**

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

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

#### **§ 9.5 Decisions to Withhold Certification**

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

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

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

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

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

### § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, which shall not occur unless Contractor has submitted all documents required by the Contract Documents to accompany the Application 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. The withholding of payment in accordance with the Contract Documents shall not be deemed to be a failure to make payment as required by the Contract Documents.

§ 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 fifteen (15) days after receipt of the Contractor's Application for Payment, or if the Owner does not either (a) notify the Contractor and the Architect of the existence of a Claim, or (b) pay the Contractor within seven days after the date established in the

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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, which shall include receipt of all applicable permits and approvals related to the Work and necessary to permanently occupy or use the Work or designated portion thereof for its intended use. The foregoing requirement shall not include regulatory inspections or approvals, the posting of Town infrastructure warranty bonds or other matters that were the responsibility of Owner. In order for the Work or designated portion thereof to be deemed substantially complete, only minor punch list items shall remain to be completed.

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

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

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

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents, and the Owner shall be entitled to retain up to two hundred percent (200%) of the amount required to correct such Work.

## **§ 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.

### § 9.10 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. The Owner shall not be obligated to make any payment to the extent that the Contractor has not submitted the documents required by the Owner as provided hereunder.

§ 9.10.1.1 The Contractor shall achieve Final Completion no later than forty-five (45) days after Substantial Completion

§ 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. The Contractor shall submit all documents outlined in this section 9.10.2 within forty-five (45) days of Final Completion as well as all outstanding submittals and Change Orders still in process.

§ 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.

§ 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.

### **§ 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.

### **§ 10.3 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, out-of-pocket 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, including without limitation Section 11.1.2.1. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies **having an A.M. Best rating of A-, VII or better, reasonably approved by the Owner and** 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. Coverages, whether written on an occurrence or claims made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained

after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents (one year following completion). Contractor's Commercial General Liability Insurance shall be on an occurrence form and shall include premises/operations (including explosion, collapse and underground coverage), elevators, independent contractors, completed operations, products, and blanket contractual liability. Completed operations coverage shall remain in effect for a period of at least one (1) year after the Final Completion of the Project.

§ 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.

§ 11.1.2.1 The insurance required by subparagraph 11.1.1 shall be written for not less than the following shown in the attached AIA Document A101 – 2017 Exhibit A, Insurance and Bonds, or greater if required by law.

FORM COVERAGE	Minimum Limits of Liability
A. Workers Compensation	Statutory limits
B. Employers Liability	\$1,000,000 Bodily Injury – Caused by accident \$1,000,000 Bodily Injury – Caused by disease
C. Commercial General Liability	\$1,000,000 each Occurrence - Bodily Injury & Property Damage \$2,000,000 General Aggregate that applies on a per project basis \$2,000,000 Products/Completed Operations Aggregate \$1,000,000 per person or Organization (Personal & Advertising Injury)
D. Business Automobile	\$1,000,000 each accident including hired, non-owned and owned vehicles
E. Umbrella Policy	\$2,000,000 each occurrence; \$2,000,000 aggregate
F. Additional Insurance: The insurance coverages listed herein shall include the following:	
1. Contractual Liability Coverage shall be provided.	
2. Include the following as additional insureds: The Town of Dewey Beach, Sussex County, and George, Miles & Buhr, LLC	
a. Additional Insured Status to be on a primary basis.	
b. Additional Insured Coverage should include both work in process and completed work.	
c. Additional Insured Status is to be maintained for One Year after completion of the job.	
3. Completed Operations Coverage to be maintained for One Year after completion of the job.	
4. Thirty (30) days prior written notice of cancellation.	
5. The Contractor shall defend any and all suits brought against the Owner, and its representatives, offices, agents, and employees by any employee or other person (whether employed by the Contractor or not) for damage to property and/or injury to persons (including death) alleged or claimed to have been caused by or through the performance by the Contractor or the work, including work required by Article "guarantees," or the condition of the site, and shall indemnify and hold harmless the Owner, and its representatives, officers and agents, and employees of each of them from and against any and all claim or claims arising out of the work performed by the Contractor or the conditions of the site, and whether or not such claim or claims are based in whole or in part on the negligence or contributory negligence of any one or more of them; the Contractor shall pay, liquidate, and discharge any and all claims or demands for personal injury (including death), and for loss or damage to any and all property caused by, growing out of or incidental to the performance of the work by the Contractor or the condition or the site, including, without the foregoing thereto, damage to the work and other property of the Owner, and including all other damages and all costs and expenses of suits and reasonable attorneys' fees. The obligations set forth in this article shall, but not by way of limitations, specifically include all claims and judgments arising or alleged to arise with respect to the Protection of Adjacent Land Owners. In the event of any such injury (including death) or loss or damage (or claim or claims therefore), the Contractor shall give immediate notice thereof to the Owner.	
6. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is	

located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

7. Contractor shall require all Subcontractors to maintain during the term of this Agreement, commercial general liability insurance, business auto liability insurance and workers compensation and employer's liability insurance in the same manner as specified for Contractor. Contractor shall furnish Subcontractor certificates of insurance to Owner immediately upon request.

8. No acceptance and/or approval of any Insurance by Owner shall be construed as relieving or excusing Contractor, or the surety, or its bonds, from any liability or obligation imposed upon either or both of them by the provisions of the contract

**§ 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 three (3) 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.

**§ 11.2.2 Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

## **§ 11.3 Waivers of Subrogation**

**§ 11.3.1** The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3)

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Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

**§ 11.3.2** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

#### **§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance**

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

#### **§11.5 Adjustment and Settlement of Insured Loss**

**§ 11.5.1** A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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

### **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

#### **§ 12.1 Uncovering of Work**

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

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may, with Owner's concurrence, request in writing 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, the Owner, or any governmental authority for 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. Such one-year period shall be extended for latent defects not discoverable within the one-year period until such time as the latent defect is reasonably discoverable.

**§ 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.

## **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.

### **§ 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 specified in A101 of the Contract Documents. No interest is payable on amounts properly withheld.

§ 13.6 **Written Notice** Written notice shall be deemed to have been duly served if given when delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or designated as the person holding the position for notice in the Contract Documents, or delivered to, or three (3) business days after same is sent by registered or certified mail or by courier service providing proof of

delivery to, the last business address known to the party giving notice. the address designated for notice in the Contract Documents. Written notice under the Contract Documents may also be provided to any party by telecopier to the telecopier number provided for the recipient in the Contract Documents, provided that the sender's transmission equipment confirms in writing receipt of the entire transmission at such number, and further provided that the sender same day mails a copy of said notice to the recipient at the address for notice provided in the Contract Documents. Notice provided by telecopier shall be deemed received on the day following the date of transmission.

§ 13.7 Record Drawings: During the progress of the job, the Contractor shall keep a careful record at the job site of all changes and corrections to the information shown on the Drawings, Specifications, Addenda and Change Orders. The Contractor shall enter such changes and corrections on one set of Contract Documents immediately. The record documents shall indicate, in addition to all changes and corrections, the actual location referenced from two permanently fixed surface structures of all subsurface utilities installed or uncovered by him. At the time of beneficial occupancy of each facility involved under the Contract, the Contractor shall submit to the Architect one set of record documents as required herein. Final payment, with respect to the Contract as a whole, will be withheld until proper record documents have been furnished to the Architect. Acceptance by the Architect or Owner of record drawings prepared by the Contractor should not be construed to mean Architect or Owner have done a detailed review of the information contained within them, nor do they guarantee their accuracy or completeness.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

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

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable costs incurred by reason of such termination, and for payment of costs directly related to the Work thereafter performed by the Contractor in terminating the Contract, including reasonable demobilization and cancellation costs, proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, and profit thereon; but not including any overhead, profit or other damages for Work not executed.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work 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, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3, **provided that the Work is not authorized to proceed within that seven-day period.**

### § 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;

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- .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 substantial 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 unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

#### § 14.3 Suspension by the Owner for Convenience

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

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted 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 Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

§14.4.4 In the event that the Contract is terminated by the Owner pursuant to this Article 14, provided all sums agreed to be due and owing are first paid to Contractor the Contractor agrees to assign or cause to be assigned to the Owner, to the extent directed by the Owner, all of the Contractor's right, title and interest in any Subcontracts and purchase orders placed with respect to the Project. The Contractor's agreement to cause such assignment of Subcontracts and purchase

orders shall survive the termination of the Contract.

§ 14.4.5 Upon receipt of any notice of termination under this Paragraph 14.4, the Contractor shall, unless the notice directs otherwise, immediately discontinue the Work on that date and, to the extent specified in the notice, place no further orders or subcontracts for materials, equipment, services, or facilities, except as may be necessary for completion of such portion of the Work as is not discontinued. The Contractor shall promptly make every reasonable effort to procure cancellation upon terms satisfactory to the Owner of all orders and subcontracts to the extent they relate to performance of the discontinued portion of the Work. Thereafter, the Contractor shall do only such Work as may be necessary to preserve and protect work already in progress and to protect materials, plants and equipment on the site or in transit thereto.

§ 14.4.6 Upon such termination, the obligations of the Contractor shall continue as to portions of the Work already performed and as to bona fide obligations assumed by the Contractor prior to 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, adjustment or interpretation of Contract terms, 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, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

#### **§ 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 shall be expressly stated to be a Claim under this Article 15 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.

§ 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 Notwithstanding anything to the contrary contained in the Contract Documents, 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. Such notice shall include, to the extent then known by the Contractor, full details and substantiating data to permit evaluation by the

Owner and the Architect. If further, or other, information subsequently becomes known to the Contractor, it shall promptly be furnished to the Owner and the Architect in writing. 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. Should the Contractor contend that it is entitled to an extension of time for completion of any portion or portions of the Work, it shall, within fourteen (14) days of the occurrence of the cause of the delay, notify the Owner in writing of the existence of the delay, setting forth (a) the cause for the delay, (b) a description of the portion or portions of Work affected thereby, and (c) all details pertinent thereto. If it is impracticable to specify the length of such delay at the time the notice referred to in the preceding sentence is delivered, then the Contractor shall provide the Owner with periodic (not less than weekly) supplemental notices during the period over which the event continues. Such supplemental notices shall keep the Owner informed of any change, development, progress or other relevant information concerning the event of which the Contractor is aware. It is a condition precedent to the consideration or prosecution of any Claim for extension time that the foregoing procedures be strictly adhered to in such instance, and if the Contractor fails to comply in all material respects, then the Contractor shall be deemed to have waived such Claim. Within fourteen (14) days after the expiration of any such delay, the Contractor shall deliver to the Owner a subsequent written application for the specific number of days of extension of time requested, which, if accepted by the Owner, shall be memorialized in a Change Order. No extension of time shall be granted to the Contractor to the extent that, notwithstanding the existence of any circumstance beyond the Contractor's control, delay would have resulted from any event due to a concurrent unexcused delay of the Contractor. Except to the extent prohibited by law or as otherwise agreed to by the Owner in its sole discretion, the Contractor agrees that whether or not any delay shall be the basis for an extension of time, it shall have no Claim against the Owner for any increase in the Contract Sum, nor a Claim against the Owner for payment or allowance of any kind of damage, loss or expense resulting from delays, hindrances, obstructions or interferences with the Work, unless such delays were caused by the active interference of the Owner (but not the Architect) in the progress of the Work.

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

#### **§ 15.1.7 Waiver of Claims for Consequential Damages**

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

#### **§ 15.2 Initial Decision**

**§ 15.2.1** Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

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

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

#### § 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

#### § 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

# **Additions and Deletions Report for** **AIA® Document A201® – 2017**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

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## **PAGE 1**

New Construction For: Dewey Beach Town Hall & Police Department  
1505 Coastal Highway  
Dewey Beach, Delaware 19975

...

The Town of Dewey Beach  
105 Rodney Ave  
Dewey Beach, Delaware 19975

...

George, Miles & Buhr, LLC  
206 West Main Street  
Salisbury, MD 21801

## **PAGE 2**

The Contract Documents form the Contract for Construction. The Contract together with the performance and payment bond, if required, 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.

...

The Project is the total construction described in the Agreement 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.

...

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~~diagrams, including electronic versions of the foregoing.

...

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~~materials, including electronic versions of the foregoing.

...

**§ 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. Contractor warrants and represents to Owner that, as of execution of this Contract, Contractor is not aware of any conflict or inconsistency in or among the Contract Documents, or between the Contract Documents and applicable codes in effect. The parties acknowledge and agree that the Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, nor is the Contractor responsible for the overall design of the Project. In the event of a conflict or an inconsistency in or among the Contract Documents, or between the Contract Documents and applicable codes in effect at the time the Contract Sum is bid or negotiated, the Contractor shall give written notice to the Owner and the Architect within ten (10) days of discovering any of the above-referenced conflicts. This written notice will be in the form of a request for information or other similar notice acceptable to the Owner. Any field directives should be documented in writing and retained by the Contractor for the Owner's later review.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract. The Contractor shall be responsible for coordinating his own work with all the contract drawings and other trades affecting his work. A claim of limitation of responsibility by the contractor due to the failure to do such coordination is not acceptable.

§ 1.2.1.2 The Contractor shall be responsible for coordinating his own work with all the contract drawings and other trades affecting his work. A claim of limitation of responsibility by the contractor due to the failure to do such coordination is not acceptable.

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The parties shall agree upon ~~written~~ protocols governing the transmission and use of, ~~and reliance on,~~ 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.

...

Any use of, or reliance on, all or a portion of a building information model without agreement to ~~written~~ 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.

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§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but insofar as the information is solely within the knowledge of the Owner and cannot be verified by the Contractor through any other source, and the Contractor shall exercise proper precautions relating to the safe performance of the Work.

...

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2. The Contractor will provide its Subcontractors with the Contract Documents. The Owner shall provide Contractor with a complete electronic version of all the Contract Documents upon execution of this contract.

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§ 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 warranty that the Contractor has visited the site, evaluated the site, and identified any limitations upon the Work or special requirements, the anticipated labor supply needed and its cost, and the availability and cost of materials, tools, and equipment, and correlated personal observations with requirements of the Contract Documents. The Contractor represents that the work to be performed on the job site will comply with all applicable laws, rules, ordinances, and regulations. Notwithstanding the foregoing sentence, the parties acknowledge and agree that the Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, nor is the Contractor responsible for the overall design of the Project. Contractor shall be fairly compensated for additional work above that which is shown within the Contract Documents that may be required to comply with applicable laws, statutes, ordinances, building codes, and rules and regulations.

§ 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 and Owner 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. Execution of the Contract by the Contractor is also

a representation and warranty that the Contractor has carefully reviewed the Contract Documents, they are complete and sufficient to enable it to perform the Work and fulfill its obligations to complete the Work as depicted and defined by the Contract Documents, and the Contractor has no knowledge of any discrepancies, omissions, or conflicts within the Contract Documents. The Contractor agrees to immediately notify in writing the Owner and the Architect if it becomes aware of any such discrepancies, omissions, or conflicts. This notification should be in the form of a request for information, or similar written notice acceptable to the Owner.

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§ 3.2.5 The Contractor shall give the Architect timely notice of any known additional Drawings, Specifications or instructions required to define the Work in greater detail, or to permit the proper progress of the Work. The Architect shall respond to such notices in a timely manner. The Contractor shall not knowingly proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional Drawings, Specifications or instructions from the Architect. If the Contractor knowingly proceeds with such Work without obtaining further Drawings, Specifications or instructions, the Contractor shall correct Work incorrectly done at the Contractor's own expense. If the Contractor fails to correct this Work, the Owner may elect to have the Work performed by itself or another entity, and deduct from the Contract Sum the cost of such Work

...

§ 3.3.2 Neither the Contractor shall nor its employees shall be deemed to be employees of the Owner, but shall act as independent contractors. Nothing in the Contract shall be construed as authority for the Contractor to make commitments that shall bind the Owner, or otherwise act on behalf of the Owner, except as the Owner may expressly authorize in writing. 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.

...

§ 3.3.4 The Contractor shall develop procedures acceptable to the Owner for implementing, documenting, reviewing and processing field questions and responses, field variance authorizations and directives, minor changes and Change Orders. The Contractor shall review requests for changes submitted by the Subcontractors, negotiate Subcontractor's proposal, submit recommendations to the Owner and, if they are accepted by the Owner in writing, prepare and submit Change Orders for the approval and signature of the Owner. All requests for information by the Contractor or any Subcontractor shall be submitted in good faith and shall contain the Contractor's or the Subcontractor's, as applicable, proposed answer to the request. If the Contractor proposes a substitution from materials or equipment specified in the Contract Documents, then, if such substituted material or equipment is accepted by the Owner, the Contractor shall pay for any redesign or reengineering costs incurred to accommodate the substitution.

§ 3.3.5 If any of the Work performed by Contractor is required to be inspected or approved by any public authority, then the Contractor shall cause such inspection or approval to be performed. No inspection performed or failed to be performed by the Owner hereunder shall be a waiver of any of the Contractor's obligations hereunder or be construed as an approval or acceptance of the Work or any part thereof.

§ 3.3.6 The Contractor acknowledges that it is the Contractor's responsibility to hire all personnel for the proper and diligent prosecution of the Work. The Contractor shall use its best efforts to maintain labor peace for the duration of the Project.

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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. The Owner is a municipal corporation and will provide the Contractor with a tax-exempt certificate.

...

§ 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-costs, damages, losses and expenses 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.~~

**§ 3.7.4 Unforeseen, 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.

**§ 3.7.6 Claims for Additional Cost.** If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Such notice shall include, to the extent then known by the Contractor, full details and substantiating data to permit evaluation by the Owner and the Architect. If further or other information subsequently becomes known to the Contractor, it shall immediately be furnished to the Owner and the Architect in writing. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

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**§ 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, updated monthly. The Contractor shall submit progress reports to the Owner and Architect on a monthly basis indicating whether the work is on schedule and provided a two-week "look ahead" for upcoming tasks. The schedule shall be maintained in Microsoft Project and the schedule, schedule revisions and progress reports shall be provided to the Owner and Architect in electronic .pdf and MS Project formats.

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§ 3.10.4 The Contractor shall keep accurate and detailed written records of the progress of the Work and shall submit monthly written progress reports to the Owner, including, but not limited to, information concerning the Work of each Subcontractor, the percentage of completion, Requests for Information ("RFIs"), the status of RFIs, the schedule and the number and amount of Change Orders. The Contractor shall also provide the required and actual staffing requirements necessary to complete the Work within the approved Project schedule. The format of the Contractor's monthly construction reports shall be approved by the Owner, which approval will not be unreasonably withheld. Delivery of a monthly progress report shall be a condition precedent to the Owner's obligation to make payment to the Contractor. The Contractor shall notify the Owner in writing of any causes for and corrective action to any deviations to the approved Project schedule. The Contractor shall maintain at the Project site, on a current basis, records of all documents, including Shop Drawings, Samples, and Product Data.

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. Samples, purchase orders, subcontracts, materials, equipment, applicable handbooks, commercial and technical standards and specifications, and any other related documents and revisions that arise out of the Contract Documents or the Work, all of which shall be the property of the Owner. The Contractor shall keep full and complete open book records at the Contractor's office and shall provide the records in total to the Owner upon completion of the Work and prior to the Contractor receiving final payment. 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.

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§ 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. The Contractor shall stamp all Shop Drawings, Product Data, Samples and other submittals to verify the Contractor's review and approval thereof, which stamp shall constitute a representation by the Contractor to the Owner that the submitted item conforms with the Contract Documents and is coordinated with other related Work. In collaboration with the Architect, the Contractor shall establish and implement procedures for expediting the processing and approval of Shop Drawings, Product Data, Samples and other submittals.

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§ 3.12.11 The Contractor shall assemble for the Architect's approval three (3) complete copies in loose leaf binders, in the manner required by the Specifications, of all operating and maintenance data from all manufacturers whose equipment is or will be installed in the Work.

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.  
§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall confine his work to the 'Limit of Construction'. It shall not obstruct public roads by delivery or other vehicles and shall work out material storage areas, vehicular access and work crew parking.

§ 3.13.2 The Contractor shall confine his work to the 'Limit of Construction'. He shall not obstruct public roads by delivery or other vehicles and shall work out material storage areas, vehicular access and work crew parking.

...

§ 3.15.1 The Contractor shall keep the premises and surrounding area in a clean and safe condition, 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.

...

**§ 3.18.1** ~~To the fullest extent permitted by law, the Contractor~~ The Contractor shall defend any and all suits brought against the Owner, and its representatives, offices, agents, and employees by any employee or other person (whether employed by the Contractor or not) for damage to property and/or injury to persons (including death) alleged or claimed to have been caused by or through the performance by the Contractor or the Work, including work required by Article "guarantees," or the condition of the site, and 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 that would otherwise exist as to a party or person described in this Section 3.18. and its representatives, officers and agents, and employees of each of them from and against any and all claim or claims arising out of the work performed by the Contractor or the conditions of the site, and whether or not such claim or claims are based in whole or in part on the negligence or contributory negligence of any one or more of them; the Contractor shall pay, liquidate, and discharge any and all claims or demands for personal injury (including death), and for loss or damage to any and all property caused by, growing out of or incidental to the performance of the work by the Contractor or the condition or the site, including, without the foregoing thereto, damage to the work and other property of the Owner, and including all other damages and all costs and expenses of suits and reasonable attorneys' fees. The obligations set forth in this Article shall, but not by way of limitations, specifically include all claims and judgments arising or alleged to arise with respect to the Protection of Adjacent Land Owners. In the event of any such injury (including death) or loss or damage (or claim or claims therefore), the Contractor shall give immediate notice thereof to the Owner.

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**§ 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. The term "Architect" means the Architect or the Architect's authorized representative.

...

**§ 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~~. Payment, or otherwise with the Owner's concurrence from time to time during the one-year warranty period. The Architect will advise and consult with the Owner. 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-with~~, and to ~~keep the Owner informed about~~, the progress and quality of the portion of the Work completed, to endeavor to guard the Owner against defects and deficiencies in the Work, 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.

...

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 Project~~.

but Owner's failure to do so shall not constitute a default under this Agreement. 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.

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**§ 4.2.6** The Architect and Owner has the authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect and Owner 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.

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**§ 5.2.5** Approval of Subcontractors. The Bid Form requires that the Contractor shall state the name of certain major subcontractors whom he proposes to employ. The Contractor shall be required to actually enter a subcontract with the subcontractors named in his proposal for these major divisions of the work, except those against whom the Architect or Owner shall have reasonable objection before the execution of the Contract. Subcontractors shall furnish suitable evidence of qualifications, experience, references and financial background, when requested by the Owner, to assist the Owner in its evaluation if such question should arise.

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**§ 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. The Owner shall not be obligated to pay for any Changes in the Work not evidenced by a written Change Order or Construction Change Directive.

...

**§ 7.1.4** All Change Orders shall be executed in writing and signed by the Owner, Contractor and Architect, and shall contain full particulars of the changes, and, as applicable, any adjustments to the Contract Sum, date of Substantial Completion or any other modification to the Contract. No changes to the scope of Work, date of Substantial Completion or Contract Sum shall be made except in accordance with a duly issued Change Order executed by both parties authorizing such changes. Except in the event of an emergency involving imminent threat of bodily injury or property damage, the Contractor shall neither seek, nor be entitled to receive, payment for any extra or additional work, unless the Contractor receives, prior to performing such work, a written direction to proceed with such extra or additional work, signed by an authorized agent of the Owner. The parties will promptly review and expedite Change Order proposals and shall promptly incorporate into a Change Order any undisputed amounts as to any additional work.

...

**§ 7.2.2** The Owner's and Contractor's agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum, the Contract Time, and the construction schedule, unless stated otherwise in the Change Order itself. Execution of a Change Order by the Contractor shall be deemed a waiver and release of any right to make a claim for additional time or money for Work to be performed under such Change Order except as otherwise set forth in the Change Order.

**§ 7.2.3** Costs Excluded - The term Cost of the Work shall not include any of the following items:

- .1** Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work. The payroll costs and other compensation excluded here

- are to be considered administrative costs covered by the Contractor's fee.
- .2 Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
  - .3 Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
  - .4 Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
  - .5 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in the work.

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**§ 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 binding dispute resolution; 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, then the Contract Time shall be extended for such reasonable time as the Architect may determine. To the fullest extent permitted under Maryland law, the Contractor hereby waives any claim for damages by reason of delay not exceeding forty-five (45) days in the commencement, prosecution, or completion of the Work, and agrees that an equitable extension of the date for Substantial Completion shall be the Contractor's sole remedy for any delays, obstructions or interferences. Such adjustments to the Contract Time shall be made by Change Order.

...

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents. Should the Contractor contend that it is entitled to an extension of time for completion of any portion or portions of the Work, it shall, within fifteen (15) days of the occurrence of the cause of the delay, notify the Owner in writing of the existence of the delay, setting forth (a) the cause for the delay, (b) a description of the portion or portions of Work affected thereby, and (c) all details pertinent thereto. If it is impracticable to specify the length of such delay at the time the notice referred to in the preceding sentence is delivered, then the Contractor shall provide the Owner with periodic (not less than weekly) supplemental notices during the period over which the event continues. Such supplemental notices shall keep the Owner informed of any change, development, progress or other relevant information concerning the event of which the Contractor is aware. It is a condition precedent to the consideration or prosecution of any Claim for extension time that the foregoing procedures be strictly adhered to in such instance, and if the Contractor fails to comply in all material respects, then the Contractor shall be deemed to have waived such Claim. Within fifteen (15) days after the expiration of any such delay, the Contractor shall deliver to the Owner a subsequent written application for the specific number of days of extension of time requested, which, if accepted by the Owner, shall be memorialized in a Change Order. No extension of time shall be granted to the Contractor to the extent that, notwithstanding the existence of any circumstance beyond the Contractor's control, delay would have resulted from any event due to a concurrent unexcused delay of the Contractor. Except to the extent prohibited by law or granted by the Owner in its sole discretion and in accordance with Section 8.3.4.1, the Contractor agrees that whether or not any delay shall be the basis for an extension of time, it shall have no Claim against the Owner for any increase in the Contract Sum, nor a Claim against the Owner for payment or allowance of any kind of damage, loss or expense resulting from delays, hindrances, obstructions or interferences with the Work, unless such delays were caused by the active interference of the Owner (but not the Architect) in the progress of the Work. Except as otherwise set forth herein, the only remedy available to the Contractor will be an extension of time as permitted pursuant to this Article 8.

**§ 8.3.4** If Contractor is delayed in the performance of the Work due to acts, omissions, conditions, events, or circumstances beyond its control and due to no fault of its own or those for whom Contractor is responsible, then, at Owner's discretion, either (a) the Contract Time(s) for performance shall be reasonably extended by Change Order, or (b) without an extension of the Contract Time(s), additional staffing will be added as needed to complete the Work, and the Contract Price will be reasonably adjusted by Change Order. By way of example, events that will entitle Contractor to an extension of the Contract Time(s) include acts or omissions of Owner or anyone under Owner's

control (including separate contractors), changes in the Work, Differing Site Conditions, Hazardous Conditions, and Force Majeure Events. An adjustment as described in clause (a) or (b) above will be Contractor's sole remedy for any delay described in this Section 8.3.

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§ 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. Each Application for Payment shall be certified as correct by the Contractor and shall be accompanied by an AIA G702 and G703 and waivers of liens from Subcontractors, Sub-subcontractors, materialmen and suppliers, and such other documentation as is required by the Specifications or other Contract Documents.

...

§ 9.3.1.3 Progress Payments will be 90% monthly and will cover the period up to the first day of each month and are to include payment for stored materials and equipment. Payment for stored materials shall be made only for materials: (i) stored on site or in a bonded warehouse, and (ii) for which title has been irrevocably assigned to Owner.

§ 9.3.1.4 In applying for payments, excluding the first payment and the final payment, the Contractor shall submit a written certificate in the exact wording that he has paid:

- .1 Labor to date.
- .2 Vendors and material suppliers in full to include items included in his previous statement and for which he received payment from the Owner.
- .3 Subcontractors in full, less the related 10%, to the amount included in his previous statement and for which he received payment from the Owner.

Contractor shall submit partial lien releases for work performed or materials provided by his subcontractors when work is complete and when requested by the Architect.

§ 9.3.1.5 Upon acceptance of Substantial Completion of the entire work, the sum of the total payments shall be increased to equal 95% of the Contract Sum, less amounts for incomplete work and unsettled claims.

§ 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. The Contractor further agrees that receipt of payment for any Application for Payment shall conclusively be deemed to waive all liens with respect to said Work to which the Contractor may then be entitled.

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§ 9.6.1 After the Architect has issued a Certificate for Payment, which shall not occur unless Contractor has submitted all documents required by the Contract Documents to accompany the Application 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. The withholding of payment in accordance with the Contract Documents shall not be deemed to be a failure to make payment as required by the Contract Documents.

...

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within ~~seven~~ fifteen (15) days after receipt of the Contractor's Application for Payment, or if the Owner does not either (a) notify the Contractor

and the Architect of the existence of a Claim, or (b) 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.

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**§ 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, which shall include receipt of all applicable permits and approvals related to the Work and necessary to permanently occupy or use the Work or designated portion thereof for its intended use. The foregoing requirement shall not include regulatory inspections or approvals, the posting of Town infrastructure warranty bonds or other matters that were the responsibility of Owner. In order for the Work or designated portion thereof to be deemed substantially complete, only minor punch list items shall remain to be completed.

...

**§ 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. Documents, and the Owner shall be entitled to retain up to two hundred percent (200%) of the amount required to correct such Work.

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**§ 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. The Owner shall not be obligated to make any payment to the extent that the Contractor has not submitted the documents required by the Owner as provided hereunder.

**§ 9.10.1.1** The Contractor shall achieve Final Completion no later than forty-five (45) days after Substantial Completion

**§ 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. The Contractor shall submit all documents outlined in this section 9.10.2 within forty-five (45) days of Final Completion as well as all outstanding submittals and Change Orders still in process.

§ 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, out-of-pocket cost and expense thereby incurred.

...

§ 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. Documents, including without limitation Section 11.1.2.1. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies **having an A.M. Best rating of A-, VII or better, reasonably approved by the Owner and** 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. Coverages, whether written on an occurrence or claims made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents (one year following completion). Contractor’s Commercial General Liability Insurance shall be on an occurrence form and shall include premises/operations (including explosion, collapse and underground coverage), elevators, independent contractors, completed operations, products, and blanket contractual liability. Completed operations coverage shall remain in effect for a period of at least one (1) year after the Final Completion of the Project.

§ 11.1.2.1 The insurance required by subparagraph 11.1.1 shall be written for not less than the following shown in the attached AIA Document A101 – 2017 Exhibit A, Insurance and Bonds, or greater if required by law.

	FORM COVERAGE	Minimum Limits of Liability
A.	Workers Compensation	Statutory limits
B.	Employers Liability	\$1,000,000 Bodily Injury – Caused by accident \$1,000,000 Bodily Injury – Caused by disease
C.	Commercial General Liability	\$1,000,000 each Occurrence - Bodily Injury & Property Damage \$2,000,000 General Aggregate that applies on a per project basis \$2,000,000 Products/Completed Operations Aggregate \$1,000,000 per person or Organization (Personal & Advertising Injury)
D.	Business Automobile	\$1,000,000 each accident including hired, non-owned and owned vehicles
E.	Umbrella Policy	\$2,000,000 each occurrence; \$2,000,000 aggregate
F.	Additional Insurance: The insurance coverages listed herein shall include the following:	
	1.	Contractual Liability Coverage shall be provided.
	2.	Include the following as additional insureds: The Town of Dewey Beach, Sussex County, and George, Miles & Buhr, LLC
	a.	Additional Insured Status to be on a primary basis.
	b.	Additional Insured Coverage should include both work in process and completed work.
	c.	Additional Insured Status is to be maintained for One Year after completion of the job.
	3.	Completed Operations Coverage to be maintained for One Year after completion of the job.
	4.	Thirty (30) days prior written notice of cancellation.
	5.	The Contractor shall defend any and all suits brought against the Owner, and its representatives, offices, agents, and employees by any employee or other person (whether employed by the Contractor or not) for damage to property and/or injury to persons (including death) alleged or claimed to have been caused by

or through the performance by the Contractor or the work, including work required by Article "guarantees," or the condition of the site, and shall indemnify and hold harmless the Owner, and its representatives, officers and agents, and employees of each of them from and against any and all claim or claims arising out of the work performed by the Contractor or the conditions of the site, and whether or not such claim or claims are based in whole or in part on the negligence or contributory negligence of any one or more of them; the Contractor shall pay, liquidate, and discharge any and all claims or demands for personal injury (including death), and for loss or damage to any and all property caused by, growing out of or incidental to the performance of the work by the Contractor or the condition of the site, including, without the foregoing thereto, damage to the work and other property of the Owner, and including all other damages and all costs and expenses of suits and reasonable attorneys' fees. The obligations set forth in this article shall, but not by way of limitations, specifically include all claims and judgments arising or alleged to arise with respect to the Protection of Adjacent Land Owners. In the event of any such injury (including death) or loss or damage (or claim or claims therefore), the Contractor shall give immediate notice thereof to the Owner.

6. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

7. Contractor shall require all Subcontractors to maintain during the term of this Agreement, commercial general liability insurance, business auto liability insurance and workers compensation and employer's liability insurance in the same manner as specified for Contractor. Contractor shall furnish Subcontractor certificates of insurance to Owner immediately upon request.

8. No acceptance and/or approval of any Insurance by Owner shall be construed as relieving or excusing Contractor, or the surety, or its bonds, from any liability or obligation imposed upon either or both of them by the provisions of the contract

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**§ 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 may, with Owner's concurrence, request in writing 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.

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The Contractor shall promptly correct Work rejected by the ~~Architect or Architect~~, the Owner, or any governmental authority for 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.

...

**§ 12.2.2.1** 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. Such one-year period shall be extended for latent defects not discoverable within the one-year period until such time as the latent defect is reasonably discoverable.

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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 specified in A101 of the Contract Documents.~~ No interest is payable on amounts properly withheld.

**§ 13.6 Written Notice** Written notice shall be deemed to have been duly served if given when delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or designated as the person holding the position for notice in the Contract Documents, or delivered to, or three (3) business days after same is sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice, the address designated for notice in the Contract Documents. Written notice under the Contract Documents may also be provided to any party by telecopier to the telecopier number provided for the recipient in the Contract Documents, provided that the sender's transmission equipment confirms in writing receipt of the entire transmission at such number, and further provided that the sender same day mails a copy of said notice to the recipient at the address for notice provided in the Contract Documents. Notice provided by telecopier shall be deemed received on the day following the date of transmission.

**§ 13.7 Record Drawings:** During the progress of the job, the Contractor shall keep a careful record at the job site of all changes and corrections to the information shown on the Drawings, Specifications, Addenda and Change Orders. The Contractor shall enter such changes and corrections on one set of Contract Documents immediately. The record documents shall indicate, in addition to all changes and corrections, the actual location referenced from two permanently fixed surface structures of all subsurface utilities installed or uncovered by him. At the time of beneficial occupancy of each facility involved under the Contract, the Contractor shall submit to the Architect one set of record documents as required herein. Final payment, with respect to the Contract as a whole, will be withheld until proper record documents have been furnished to the Architect. Acceptance by the Architect or Owner of record drawings prepared by the Contractor should not be construed to mean Architect or Owner have done a detailed review of the information contained within them, nor do they guarantee their accuracy or completeness.

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**§ 14.1.3** If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and including reasonable costs incurred by reason of such ~~termination.~~ termination, and for payment of costs directly related to the Work thereafter performed by the Contractor in terminating the Contract, including reasonable demobilization and cancellation costs, proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, and profit thereon; but not including any overhead, profit or other damages for Work not executed.

**§ 14.1.4** If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work 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, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in ~~Section 14.1.3.~~ Section 14.1.3, provided that the Work is not authorized to proceed within that seven-day period.

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**§14.4.4** In the event that the Contract is terminated by the Owner pursuant to this Article 14, provided all sums agreed to be due and owing are first paid to Contractor the Contractor agrees to assign or cause to be assigned to the Owner, to the extent directed by the Owner, all of the Contractor's right, title and interest in any Subcontracts and purchase orders placed with respect to the Project. The Contractor's agreement to cause such assignment of Subcontracts and purchase orders shall survive the termination of the Contract.

**§ 14.4.5** Upon receipt of any notice of termination under this Paragraph 14.4, the Contractor shall, unless the notice directs otherwise, immediately discontinue the Work on that date and, to the extent specified in the notice, place no further orders or subcontracts for materials, equipment, services, or facilities, except as may be necessary for completion of such portion of the Work as is not discontinued. The Contractor shall promptly make every reasonable effort to procure cancellation upon terms satisfactory to the Owner of all orders and subcontracts to the extent they

relate to performance of the discontinued portion of the Work. Thereafter, the Contractor shall do only such Work as may be necessary to preserve and protect work already in progress and to protect materials, plants and equipment on the site or in transit thereto.

§ 14.4.6 Upon such termination, the obligations of the Contractor shall continue as to portions of the Work already performed and as to bona fide obligations assumed by the Contractor prior to the date of termination.

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A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, 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.

...

§ 15.1.3.1 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 shall be expressly stated to be a Claim under this Article 15 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.

...

§ 15.1.4.1 Pending ~~Notwithstanding anything to the contrary contained in the Contract Documents, 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.~~

...

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. Such notice shall include, to the extent then known by the Contractor, full details and substantiating data to permit evaluation by the Owner and the Architect. If further, or other, information subsequently becomes known to the Contractor, it shall promptly be furnished to the Owner and the Architect in writing. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

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§ 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. Should the Contractor contend that it is entitled to an extension of time for completion of any portion or portions of the Work, it shall, within fourteen (14) days of the occurrence of the cause of the delay, notify the Owner in writing of the existence of the delay, setting forth (a) the cause for the delay, (b) a description of the portion or portions of Work affected thereby, and (c) all details pertinent thereto. If it is impracticable to specify the length of such delay at the time the notice referred to in the preceding sentence is delivered, then the Contractor shall provide the Owner with periodic (not less than weekly) supplemental notices during the period over which the event continues. Such supplemental notices shall keep the Owner informed of any change, development, progress or other relevant information concerning the event of which the Contractor is aware. It is a condition precedent to the consideration or prosecution of any Claim for extension time that the foregoing procedures be strictly adhered to in such instance, and if the Contractor fails to comply in all material respects, then the Contractor shall be deemed to have waived such Claim. Within fourteen (14) days after the expiration of any such delay, the Contractor shall deliver to the Owner a subsequent written application for the specific number of days of extension of time requested, which, if accepted by the Owner, shall be memorialized in a Change

Order. No extension of time shall be granted to the Contractor to the extent that, notwithstanding the existence of any circumstance beyond the Contractor’s control, delay would have resulted from any event due to a concurrent unexcused delay of the Contractor. Except to the extent prohibited by law or as otherwise agreed to by the Owner in its sole discretion, the Contractor agrees that whether or not any delay shall be the basis for an extension of time, it shall have no Claim against the Owner for any increase in the Contract Sum, nor a Claim against the Owner for payment or allowance of any kind of damage, loss or expense resulting from delays, hindrances, obstructions or interferences with the Work, unless such delays were caused by the active interference of the Owner (but not the Architect) in the progress of the Work.



# **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, Morgan H. Helfrich, AIA, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:43:08 ET on 11/14/2024 under Order No. 3104239933 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

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*(Signed)*

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*(Title)*

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*(Dated)*

**DIVISION 00 – BIDDING REQUIREMENTS,  
CONTRACT FORMS AND CONDITIONS OF THE CONTRACT**

**SECTION 00 90 00**

**MODIFICATIONS TO THE GENERAL CONDITIONS**

These modifications contain changes and conditions to the General Conditions of the Contract for Construction AIA Document A201, 2017 Edition. Where any part of the General Conditions are modified or deleted by these modifications, the unaltered provisions remain in effect.

**MODIFICATIONS**

**ARTICLE 1 – GENERAL PROVISIONS**

Add 1.2.1.1: The Contractor shall be responsible for coordinating his own work with all the contract drawings and other trades affecting his work. A claim of limitation of responsibility by the contractor due to the failure to do such coordination is not acceptable.

**ARTICLE 3 - CONTRACTOR**

Add 3.13.2: The Contractor shall confine his work to the 'Limit of Construction'. He shall not obstruct public roads by delivery or other vehicles and shall work out material storage areas, vehicular access and work crew parking.

Paragraph 3.18.1, line 5, delete the phrase "other than the Work itself".

**ARTICLE 5 - SUBCONTRACTORS**

Add 5.2.5: Approval of Subcontractors. The Bid Form requires that the Contractor shall state the name of certain major subcontractors whom he proposes to employ. The Contractor shall be required to actually enter a subcontract with the subcontractors named in his proposal for these major divisions of the work, except those against whom the Architect or Owner shall have reasonable objection before the execution of the Contract. Subcontractors shall furnish suitable evidence of qualifications, experience, references and financial background, when requested by the Owner, to assist the Owner in its evaluation if such question should arise.

## ARTICLE 9 - PAYMENTS AND COMPLETION

Add 9.3.1.3: Progress Payments will be 90% monthly and will cover the period up to the first day of each month and are to include payment for stored materials and equipment. Payment for stored materials shall be made only for materials: (i) stored on site or in a bonded warehouse, and (ii) for which title has been irrevocably assigned to the Town of Dewey Beach.

Add 9.3.1.4: In applying for progress payments, excluding the first payment. Note: Final payment is not a progress payment under 9.6, but is addressed separately by 9.10. The Contractor shall submit a written certificate in the exact wording that he has paid:

- a. Labor to date.
- b. Vendors and material suppliers in full to include items included in his previous statement and for which he received payment from the Owner.
- c. Subcontractors in full, less the related 10%, to the amount included in his previous statement and for which he received payment from the Owner.

Contractor shall submit partial lien releases for work performed or materials provided by his subcontractors when work is complete and when requested by the Architect.

Add 9.3.1.5: Upon acceptance of Substantial Completion of the entire work, the sum of the total payments shall be increased to equal 95% of the Contract Sum, less amounts for incomplete work and unsettled claims.

Add 9.3.1.6: Substantial Completion of the entire work shall occur twice for the project, at the completion of each phase of construction as indicated on the drawings. Applications of payment shall be structured to be reflect portions of work that constitutes each phase of construction, to accurately evaluate the cost and percentage complete of work for each phase.

Add 9.8.6: Issuance of the Certificate of Substantial Completion for the first phase of work as indicated on the drawings, is intended to permit the Owner to occupy the work provided that such occupancy or use is consented to by the insurer and authorized by Public Authorities having jurisdiction over the Project.

## ARTICLE 11 - INSURANCE

Add 11.1.2.1: The insurance required by subparagraph 11.1.1 shall be written for not less than the following, or greater if required by law.

FORM COVERAGE

Minimum Limits of Liability

- |   |   |
|---|---|
| A. Workers Compensation   | Statutory limits  |
| B. Employers Liability  | \$1,000,000 Bodily Injury –<br>Caused by accident   |
|   | \$1,000,000 Bodily Injury –<br>Caused by disease  |
| C. Commercial General Liability   | \$1,000,000 each Occurrence -<br>Bodily Injury & Property Damage  |
|   | \$2,000,000 General Aggregate<br>that applies on a per project basis  |
|   | \$2,000,000 Products/Completed<br>Operations Aggregate  |
|   | \$1,000,000 per person or<br>Organization (Personal &<br>Advertising Injury)  |
| D. Business Automobile  | \$1,000,000 each accident<br>including hired, non-owned and<br>owned vehicles   |
| E. Umbrella Policy  | \$2,000,000 each occurrence;<br>\$2,000,000 aggregate   |
| F. Additional Insurance: The insurance coverages listed herein shall include the following: |   |
| 1.  | Contractual Liability Coverage shall be provided.   |
| 2.  | Town of Dewey Beach, Sussex County, George, Miles & Buhr LLC and its consultants shall be named as “Additional Insureds” on the Contractor’s Commercial General Liability Policy. |
|   | a. Additional Insured Status to be on a primary basis.  |
|   | b. Additional Insured Coverage should include both work in process and completed work.  |
|   | c. Additional Insured Status is to be maintained for One Year after completion of the job.  |
| 3.  | Completed Operations Coverage to be maintained for One Year after completion of the job.  |
| 4.  | Thirty (30) days prior written notice of cancellation.  |
| 5.  | The Contractor shall defend any and all suits brought against the Owner, and its representatives, offices, agents, and employees by   |

any employee or other person (whether employed by the Contractor or not) for damage to property and/or injury to persons (including death) alleged or claimed to have been caused by or through the performance by the Contractor or the work, including work required by Article "guarantees," or the condition of the site, and shall indemnify and hold harmless the Owner, and its representatives, officers and agents, and employees of each of them from and against any and all claim or claims arising out of the work performed by the Contractor or the conditions of the site, and whether or not such claim or claims are based in whole or in part on the negligence or contributory negligence of any one or more of them; the Contractor shall pay, liquidate, and discharge any and all claims or demands for personal injury (including death), and for loss or damage to any and all property caused by, growing out of or incidental to the performance of the work by the Contractor or the condition or the site, including, without the foregoing thereto, damage to the work and other property of the Owner, and including all other damages and all costs and expenses of suits and reasonable attorneys' fees. The obligations set forth in this article shall, but not by way of limitations, specifically include all claims and judgments arising or alleged to arise with respect to the Protection of Adjacent Land Owners. In the event of any such injury (including death) or loss or damage (or claim or claims therefore), the Contractor shall give immediate notice thereof to the Owner.

## **ARTICLE 13 – MISCELLANEOUS PROVISIONS**

Add 13.8 – Record Drawings: During the progress of the job, the Contractor shall keep a careful record at the job site of all changes and corrections to the information shown on the Drawings, Specifications, Addenda and Change Orders. The Contractor shall enter such changes and corrections on one set of Contract Documents immediately. The record documents shall indicate, in addition to all changes and corrections, the actual location referenced from two permanently fixed surface structures of all subsurface utilities installed or uncovered by him. At the time of beneficial occupancy of each facility involved under the Contract, the Contractor shall submit to the Architect one set of record documents as required herein. Final payment, with respect to the Contract as a whole, will be withheld until proper record documents have been furnished to the Engineer. Acceptance by the Architect or Owner of record drawings prepared by the Contractor should not be construed to mean Architect or Owner have done a detailed review of the information contained within them, nor do they guarantee their accuracy or completeness.

**END OF SECTION**

**DIVISION 0 – BIDDING REQUIREMENTS,  
CONTRACT FORMS AND CONDITIONS OF THE CONTRACT**

**SECTION 00 90 13**

**PREVAILING WAGES FOR HIGHWAY CONSTRUCTION**

Bidders shall comply with the requirements of the above document. Submitting a bid denotes acknowledgement by the Bidder that he has read and understands the content of this document.

**END OF SECTION**



STATE OF DELAWARE  
DEPARTMENT OF LABOR  
DIVISION OF INDUSTRIAL AFFAIRS  
OFFICE OF LABOR LAW ENFORCEMENT  
PHONE: (302) 318-2769

Mailing Address:  
252 Chapman Road  
Suite 210  
Newark, DE 19702

Located at:  
252 Chapman Road  
Suite 210  
Newark, DE 19702

PREVAILING WAGES FOR HIGHWAY CONSTRUCTION EFFECTIVE MARCH 15, 2024

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	65.24	65.24	69.05
CARPENTERS	65.85	61.06	49.30
CEMENT FINISHERS	70.64	43.32	44.16
ELECTRICAL LINE WORKERS	35.67	57.63	28.21
ELECTRICIANS	81.62	81.62	81.62
IRON WORKERS	86.81	31.66	33.63
LABORERS	54.96	50.59	49.65
MILLWRIGHTS	21.38	20.75	17.93
PAINTERS	81.29	81.29	81.29
PILEDRIVERS	95.51	31.53	88.62
POWER EQUIPMENT OPERATORS	82.31	52.56	48.15
SHEET METAL WORKERS	30.20	26.96	24.40
TRUCK DRIVERS	51.73	37.48	45.64

CERTIFIED: 3-15-2024

BY: Salina Crossland / An Francis Audzik  
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

**NOTE:** THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 318-2769.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

THESE RATES ARE BEING PROVIDED IN ACCORDANCE WITH DELAWARE'S FREEDOM OF INFORMATION ACT.

THEY ARE NOT INTENDED TO APPLY TO ANY SPECIFIC PROJECT.

**DIVISION 0 – BIDDING REQUIREMENTS,  
CONTRACT FORMS AND CONDITIONS OF THE CONTRACT**

**SECTION 00 90 16**

**PREVAILING WAGES FOR BUILDING CONSTRUCTION**

Bidders shall comply with the requirements of the above document. Submitting a bid denotes acknowledgement by the Bidder that he has read and understands the content of this document.

**END OF SECTION**



STATE OF DELAWARE  
DEPARTMENT OF LABOR  
DIVISION OF INDUSTRIAL AFFAIRS  
OFFICE OF LABOR LAW ENFORCEMENT  
PHONE: (302) 318-2769

Mailing Address:  
252 Chapman Road  
Suite 210  
Newark, DE 19702

Located at:  
252 Chapman Road  
Suite 210  
Newark, DE 19702

PREVAILING WAGES FOR BUILDING CONSTRUCTION  
EFFECTIVE MARCH 15, 2024 - AMENDED JUNE 14, 2024

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	29.03	35.74	52.03
BOILERMAKERS	86.90	44.09	64.81
BRICKLAYERS	65.24	65.24	65.24
CARPENTERS	61.06	61.06	49.30
CEMENT FINISHERS	91.66	65.19	50.55
ELECTRICAL LINE WORKERS	57.72	49.50	37.74
ELECTRICIANS	81.62	81.62	81.62
ELEVATOR CONSTRUCTORS	113.66	81.88	103.45
GLAZIERS	83.30	83.30	71.92
INSULATORS	67.20	67.20	67.20
IRON WORKERS	75.32	75.32	75.32
LABORERS	55.65	55.65	55.65
MILLWRIGHTS	85.36	85.36	68.57
PAINTERS	57.60	57.60	57.60
PILEDRIVERS	88.62	49.97	40.41
PLASTERERS	37.89	37.89	28.08
PLUMBERS/PIPEFITTERS/STEAMFITTERS	77.30	80.57	71.11
POWER EQUIPMENT OPERATORS	81.29	81.29	81.29
ROOFERS-COMPOSITION	29.45	29.41	31.82
ROOFERS-SHINGLE/SLATE/TILE	23.34	27.77	21.83
SHEET METAL WORKERS	84.53	84.53	84.53
SOFT FLOOR LAYERS	60.12	60.12	60.12
SPRINKLER FITTERS	70.52	70.52	70.52
TERRAZZO/MARBLE/TILE FNRS	70.79	70.79	79.54
TERRAZZO/MARBLE/TILE STRS	78.73	78.73	88.22
TRUCK DRIVERS	55.25	34.83	27.11

CERTIFIED: June 14, 2024

BY *Selina Chordas / La Francis Acker*  
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

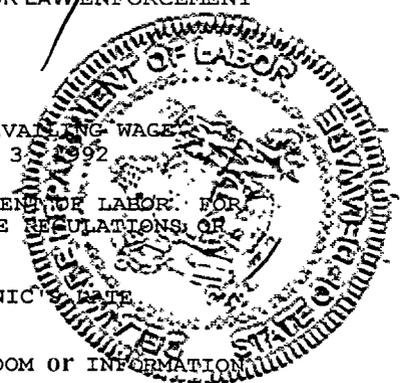
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THESE RATES ARE BEING PROVIDED IN ACCORDANCE WITH DELAWARE'S FREEDOM OF INFORMATION ACT.

THEY ARE NOT INTENDED TO APPLY TO ANY SPECIFIC PROJECT,



**DIVISION 0 – BIDDING REQUIREMENTS,  
CONTRACT FORMS AND CONDITIONS OF THE CONTRACT**

**SECTION 00 92 00**

**AIA DOCUMENT G706 - 1994  
CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS**

At completion, and as a condition of final acceptance and payment, the Contractor shall be required to submit documentation according to the requirements of the above document.

**END OF DOCUMENT**

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**DIVISION 0 – BIDDING REQUIREMENTS,  
CONTRACT FORMS AND CONDITIONS OF THE CONTRACT**

**SECTION 00 93 00**

**AIA DOCUMENT G706A - 1994  
CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS**

At completion, and as a condition of final acceptance and payment, the Contractor shall be required to submit documentation according to the requirements of the above document.

**END OF DOCUMENT**

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# **DIVISION 01 – GENERAL REQUIREMENTS**

## **SECTION 01 11 00**

### **SUMMARY OF WORK**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Award of the following work to one (1) General Contractor for single source responsibility. This firm shall engage other specialist firms to perform any part of the work which they are not equipped or qualified to perform properly with their own personnel.

1. Do not engage any firm unacceptable to manufacturers of products to be used.
2. General Contractor is responsible for coordination of materials/data submission, production/delivery, installation, warranties and guarantees, and administration of subcontracts
3. Do not engage any firm unacceptable to Architect or Owner.

B. Furnish labor and materials to construct the project as specified in the construction documents.

C. The Owner reserves the right, without penalty, not to award a Contract.

##### **1.02 CONTRACT**

A. The specified work is to be accomplished under a single Base Bid.

##### **1.03 EXCLUSIVE VENDOR SUBCONTRACTS**

A. The Owner has elected to engage the services of a select list of specialist vendor/subcontractors for this project.

B. The General Contractor shall enter into subcontracts with the named specialist vendor/subcontractor firms as part of the general Construction Contract.

1. Bids by firms other than those listed herein will not be accepted.

C. List of Approved Exclusive Specialist Vendor/Subcontractors for the Town of Dewey Beach:

1. Interior/Exterior Video Camera + Security Systems. Advantech Inc., 151 Garrison Oak Dr, Dover DE 19901 (Attn: Alex Goussev, [Alex.Goussev@advantechsecurity.net](mailto:Alex.Goussev@advantechsecurity.net) , 302-674-8405 x 103).
2. IT Equipment (Police and Town). Think SecureNet, Lewes, Delaware (Attn: Geoff Morton, [gmorton@Securenetmd.com](mailto:gmorton@Securenetmd.com), 302-645-7770).

D. List of Approved Exclusive Specialist Vendor/Subcontractors for Sussex County EMS:

1. Door Hardware Locksets: Penn-Del Lock, Inc., 37385, Rehoboth Avenue, Suite 4, Rehoboth, Delaware 19971, 302-227-6192, [www.penndellock.com](http://www.penndellock.com).
2. Prowatch Electric Door Locks: AdvanTech Inc., 151 Garrison Oak Drive, Dover, Delaware 19901, 302-674-8405, [www.advantech-inc.com](http://www.advantech-inc.com). Contact Ryan Kelly.
3. Fire Alarm:
  - a. Alarm Engineering, 2204 W. Zion Road, Salisbury, Maryland 21801, 410-546-2210, [www.alarmengineering.com](http://www.alarmengineering.com).
  - b. B Safe Inc – 109 Baltimore Avenue, Wilmington, DE 19805, 302-633-1833,
  - c. AdvanTech Inc., 151 Garrison Oak Drive, Dover, Delaware 19901, 302-674-8405, [www.advantech-inc.com](http://www.advantech-inc.com). Contact Ryan Kelly.
4. Exterior signage: Tower Signs LLC., 22876 Sussex Hwy #6, Seaford, DE 19973, 302-314-5925
5. Garage Doors & Openers: Clark & Sons Inc., 1819 Northwood Dr, Salisbury, MD 21801, 410-749-7436
6. Or Approved Equal.

#### 1.04 WORK SCHEDULE

A. A construction schedule based upon the base bid shall be submitted for approval by the Owner along with the Contractor's bid prior to start of construction.

B. Contractor shall update his construction schedule on a monthly basis or as otherwise requested by the owner.

#### 1.05 HOURS OF WORK

A. All work shall be performed in accordance with the Code of the Town of Dewey Beach and current edition of construction rules.

1. Sunday work by contractors / sub-contractors is always prohibited
2. From May 15 through September 15:
  - a. NO work on Saturdays by Contractors
  - b. Weekday work by Contractors allowed 8 AM to 6 PM
  - c. Homeowners may physically do work on their property (no Contractors):
    1. Work weekdays from 8 AM to 6 PM
    2. Work weekends & holidays from 9 AM to 6 PM
3. From September 16 through May 14:
  - a. Saturday work by Contractors allowed 9 AM to 6 PM
  - b. Weekday work by Contractors allowed 8 AM to 6 PM
  - c. Homeowners may physically do work on their property (no Contractors):
    1. Work weekdays from 8 AM to 6 PM
    2. Work weekends & holidays from 9 AM to 6 PM
4. Year-Round:
  - a. No work on the following holidays:
    - i. New Year's Day
    - ii. Memorial Day
    - iii. Independence Day
    - iv. Labor Day
    - v. Thanksgiving Day
    - vi. Christmas Day
  - b. Construction inside enclosed structure & creating no noise disturbance is allowed on:
    - i. Martin Luther King Jr. Day
    - ii. Columbus Day
    - iii. President's Day
    - iv. Veterans' Day
  - c. Demolition:
    - i. NO demolition activity, requiring a permit, allowed on weekends
  - d. Pile Driving:
    - i. NO pile driving from 6 pm on the Thursday before Memorial Day (as observed) until 8 AM on the Tuesday after Labor Day (as observed)
    - ii. NO pile driving on Saturdays / Sundays

## **1.06 USE OF PREMISES**

- A. Use of premises by Contractor to be limited to the specified work areas and Owner approved storage area.

## **1.07 OWNER OCCUPANCY**

- A. The Contractor shall work toward substantial completion of all work concurrently.

## **1.08 CODES**

A. All work shall be performed in accordance with the applicable codes and rules and regulations of the regulatory agencies which have jurisdiction over this project and its location.

## **1.09 PROGRESS MEETINGS**

A. In addition to a pre-construction meeting, progress meetings will be held during the course of the project at dates and times to be announced.

## **1.10 PERMITS AND LICENSES**

A. All required permits shall be paid for and obtained by the Contractor.

B. All Contractors must be licensed by the State of Delaware.

C. All Contractors must be licensed in the Town of Dewey Beach.

## **1.11 FEMA and NFIP Compliance**

A. The building and site work shall comply with the National Flood Insurance Program (NFIP) regulations as outlined in 44 CFR § 60.3 and all applicable FEMA Technical Bulletins.

B. Design and construction practices shall adhere to the standards set forth by FEMA for flood-resistant construction, including the following Technical Bulletins:

1. Technical Bulletin 0: User's Guide to Technical Bulletins
2. Technical Bulletin 1: Requirements for Flood Openings
3. Technical Bulletin 3: Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings
4. Technical Bulletin 4: Elevator Installation for Buildings in SFHAs
5. Technical Bulletin 5: Free-of-Obstruction Requirements in Coastal High Hazard Areas
6. Technical Bulletin 7: Wet Floodproofing Requirements
7. Technical Bulletin 8: Corrosion Protection for Metal Connectors and Fasteners
8. Technical Bulletin 10: Ensuring Structures Built on Fill Are Reasonably Safe from Flooding

## **1.12 Floodplain Management**

A. All work shall be conducted in accordance with the local floodplain management ordinance and the building code requirements related to flood-resistant construction.

B. The lowest floor of the building shall be elevated to or above the FEMA flood zone AE 5 feet + BFE of 3 feet. Enclosed areas for the use of parking of vehicles, building access, (stairwells and foyers), and storage are permitted to be in the flood zone.

### **1.13 Dry Floodproofing**

A. Non-residential portions of the building shall be dry floodproofed to at least 1 foot above the BFE, in accordance with FEMA Technical Bulletin 3 and ASCE 24.

B. All dry floodproofing measures shall be certified by a registered professional engineer or architect using FEMA Form 086-0-34.

### **1.14 Flood Openings**

A. Flood openings shall be installed in enclosed areas within the FEMA BFE to allow automatic entry and exit of floodwaters, as specified in FEMA Technical Bulletin 1.

### **1.15 Corrosion-Resistant Materials**

A. Use corrosion-resistant materials for all metal connectors and fasteners in accordance with FEMA Technical Bulletin 8 to ensure durability and longevity in coastal environments.

### **1.16 Utility Protection**

A. All mechanical, electrical, and plumbing systems shall be elevated above the BFE or otherwise protected to prevent floodwater entry, following the guidance in FEMA Technical Bulletin 4 and 6.

### **1.17 Regular Inspections and Maintenance**

A. Establish and implement a regular inspection and maintenance schedule for all floodproofing measures, drainage systems, and structural components to ensure continuous compliance with FEMA and NFIP standards.

**PART 2 – PRODUCTS** Not used.

**PART 3 – EXECUTION** Not used.

END OF SECTION

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 23 00**

### **ALTERNATES**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Changes to be incorporated into the work, only when that Alternate is made a part of the work by specific provisions in the Owner-Contractor Agreement. The Owner reserves the right to incorporate alternates, or parts of alternates, deemed to be in the Owner's best interest.

B. Referenced Sections of specifications stipulate pertinent requirements for products and methods to achieve the work stipulated under each Alternate.

C. Coordinate pertinent related work and modify surrounding work as required to properly integrate the work under each Alternate, and to provide the complete construction required by Contract Documents.

D. The alternates are described in Section 00 41 13, Bid Form.

#### **PART 2 - PRODUCTS**

Not used.

#### **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 29 00**

### **MEASUREMENT AND PAYMENT**

#### **1.01 SECTION INCLUDES**

A. Payment for the work completed under this Contract will be made at the lump sum, contingent/unit, and allowance prices bid, which prices shall include the furnishing of all labor, tools, equipment and materials and the performance of all work required to complete the project as indicated and specified in accordance with all requirements of the Contract Documents.

B. All incidental minor and miscellaneous items, work and materials for which no specific lump sum or unit price bid item is shown and which are necessary to complete the work and to maintain and/or repair the work, shall be done and furnished by the Contractor without extra charge.

#### **1.02 PAYMENT**

A. After the award of the Contract, the Contractor will develop an itemized breakdown of the bid amount according to specific work activities. The Contractor will be required to submit an itemized breakdown of his bid for approval within 14 days after the Pre-construction Conference. At the end of each pay period, the Contractor shall submit to the Owner or his authorized representative for approval an invoice showing percent complete for each item on the breakdown.

B. With each Application for Payment, the Contractor shall submit a Form of Waiver and Release of Mechanic's Liens relating to the work for which they are to be paid with the proceeds of such Application of Payment.

C. The Contractor shall promptly pay each Subcontractor (including suppliers, laborers and material men) performing labor or furnishing material for the work upon receipt of payment from the Owner out of the amount paid to the Contractor on account of the work for each subcontractor, supplier, laborer, or material men, the amount to which said subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such work.

D. The Owner may, on request and at his discretion, furnish to any subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Owner on account of work done by such contractor.

E. The Owner shall not have any obligation to pay or to see to the payment of any monies to any subcontractor except as may otherwise be required by law.

F. No progress payment or any partial or entire use of occupancy of the Project by the Owner shall constitute an acceptance of any work which is not in accordance with the Contract Documents.

### **1.03 PAYMENTS WITHHELD**

A. The Owner may decline to pay all or any part thereof or, because of subsequent observations, it may nullify the whole or any part of any payment previously issued, to such extent as may be necessary in its opinion to protect the Owner from loss because of:

1. Defective work not remedied.
2. Third party claims filed or reasonable evidence indicating probable filing of such claims.
3. Failure of the Contractor to make payments properly to subcontractors or for labor, material or equipment.
4. Reasonable evidence that the work cannot be completed for unpaid balance of the Contract Sum.
5. Damage to the Owner or another Contractor.
6. Reasonable evidence that the work will not be or has not been completed within the Contract time.
7. Failure to carry out the work in accordance with the Contract Documents.
8. Cancellation, material change or lapse of required insurance as specified in the Contract Documents.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 31 19**

### **PROJECT MEETINGS**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Owner's Representative, known hereafter as the Project Manager (PM), will schedule and administer pre-construction meeting, call progress meetings throughout progress of the work, and will:

1. Prepare agenda for meetings.
2. Set meeting date.
3. Make arrangements for meeting room.
4. Preside at meetings.
5. Record minutes; include significant proceedings and decisions.
6. Reproduce and distribute copies of minutes within five days after each meeting.
  - a. To participants in meeting.
  - b. To parties affected by decisions made at meeting.

B. Representatives of contractors and subcontractors attending meeting shall be qualified and authorized to act on behalf of entity each represents.

##### **1.02 PRE-CONSTRUCTION MEETING**

A. Schedule within 15 days after date of Notice to Proceed. Pre-Construction meeting must be scheduled prior to the start of any construction work stipulated in the Contract.

B. Location: As announced.

C. Attendance:

1. Owner's Representative.
2. Contractor's Project Manager.
3. Contractor's Superintendent.
4. Architect and his professional consultants.
5. Major Subcontractors.
6. Other interested parties as appropriate.

D. Suggested Agenda:

1. Discussion of:
  - a. Contract.
  - b. Certificates of Insurance.
  - c. Bonds.
  - d. List of major subcontractors and suppliers.
  - e. Projected Construction Schedule.
2. Critical work sequencing.
3. Project Coordination.
  - a. Designation of responsible personnel.
  - b. Architect's representative.
  - c. Owner's representative.
  - d. Contractor's superintendent.
4. Procedures and processing of:
  - a. Field decisions.
  - b. Proposal requests.
  - c. Substitutions.
  - d. Installation procedures.
  - e. Closeout procedures.
  - f. Submittals.
    - (1) Shop drawings - Number of copies.
    - (2) Samples.
  - g. Change Orders.
  - h. Monthly Applications for Payment.
    - (1) How many copies?
    - (2) Who approves same?
    - (3) Schedule of values.
    - (4) Stored material payments. (Off-site) (Insurance)
5. Adequacy of distribution of Contract Documents.
6. Procedures for maintaining Record Documents.
7. Use of premises.
  - a. Office, work and storage areas.
  - b. Owner's requirements.
8. Construction facilities, controls and construction aids.
9. Temporary utilities.
10. Safety and first-aid procedures.
11. Security procedures.
12. Housekeeping procedures.
13. Contractor's after-hours telephone number (3 key people).
14. Other business.

### **1.03 PROGRESS MEETINGS**

- A. Schedule as called.
- B. Location of meetings: As Announced.
- C. Attendance:
  - 1. Same personnel as at pre-construction meeting.
  - 2. Others as appropriate.
- D. Suggested Agenda:
  - 1. Review, approval of minutes of previous meeting.
  - 2. Review of work progress since previous meeting.
  - 3. Field observations, problems, and conflicts.
  - 4. Problems which impede Construction Schedules.
  - 5. Corrective measures and procedures to regain projected schedule.
  - 6. Revisions to Construction Schedule.
  - 7. Plan progress, schedule, during succeeding work period.
  - 8. Coordination of schedules.
  - 9. Review submittal schedules; expedite as required.
  - 10. Maintenance of quality standards.
  - 11. Review proposed changes for effect on Construction Schedule on completion date.
  - 12. Other business.

### **1.04 FINAL INSPECTION**

- A. Schedule as called.
- B. Attendance:
  - 1. Same personnel as at pre-construction meeting.
  - 2. Others as appropriate.
- C. Suggested agenda for walk-through:
  - 1. The final inspection and acceptance of the work will focus largely on the appearance of the finished work, as evaluated by Architect and Owner in their sole discretion.

## **PART 2 – PRODUCTS**

Not used.

**PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# DIVISION 1 – GENERAL REQUIREMENTS

## SECTION 01 33 00

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

A. Shop drawings are generally defined as all fabrication and erection drawings, diagrams, brochures, schedules, bills or material and other data prepared by the Contractor, his subcontractors, suppliers or manufacturers which illustrate the manufacturer, fabrication, construction and installation of the work, or a portion thereof.

B. All costs necessary for compliance with the requirements of this Section of the Specifications shall be included under the lump sum price bid.

C. Detailed shop drawings, data, literature for fabricated materials or equipment to be incorporated in the work shall be submitted to the Architect for review for general compliance with the Contract Documents before fabrication. The Contractor shall obtain and check manufacturer's shop drawings, certified prints and other pertinent data for conformance with all requirements of the Plans and Specification and in ample time to permit satisfactory progress of the work. After the completion of such checking and verification by the Contractor, the Contractor shall sign or stamp such drawing, which stamp shall state as follows:

Checked by \_\_\_\_\_  
(Contractor's Name)

Signed by \_\_\_\_\_  
(Checker's Name)

D. All data, drawings and correspondence from subcontractors, manufacturers or suppliers shall be routed through the Contractor. The Architect shall review only such data and details as are transmitted to him by the Contractor. All correspondence from the Contractor to the Architect shall refer to the appropriate section of these specifications containing the subject matter of the inquiry.

E. All shop drawings shall be in conformity with all requirements of the plans and specifications. All shop drawings, except diagrams, brochures, schedules and illustrations, shall be to an appropriate scale, no smaller than 1/8 inch = 1 foot 0 inches,

and shall give all dimensions necessary for installation and incorporation in the work. All shop drawings shall be accurate and complete, showing outline and section views, details, materials, accessories, appurtenances and related items.

F. The Contractor shall submit to the Architect PDF electronic files of shop drawings and approval data. The Architect's notation of the action taken will be noted on the returned PDF electronic file. At the time of each submission, the Contractor shall call to the Architect's attention, in writing, any deviations that the shop drawings may have from the requirements of the Plans and Specifications. At conclusion of the project, the Contractor shall provide (1) print copy and (1) combined PDF electronic file of all electronic file submittals.

G. Within fourteen (14) days of the Pre-construction Conference, the Contractor shall submit a list of all shop drawings to be submitted. This list can then be used as a check to ensure that all items are submitted.

H. The contractor will reimburse the owner for any shop drawing review past one resubmittal based on the hourly wages submitted in the general conditions. It is the contractor's responsibility to provide concise and through submissions.

I. Provide exterior finish selection mock-up panels for review and approval, including:

1. One (1) fibercement sheet siding panel with lap siding, board & battens, and contrasting fibercement trim along top and bottom of siding. Assembled panel shall be approximately 4 foot wide by 4 foot high. Siding and trim colors as selected by the architect from the manufacturer's standard finishes.
2. Approved panels will remain as samples until fibercement siding work is completed, and will serve, after review, as the standard for such work.

## **1.02 OPERATION AND MAINTENANCE MANUALS**

A. The Contractor shall furnish the Architect six (6) copies of a complete instruction manual for installation, operation, maintenance and lubrication of each component of all equipment. The operation and maintenance manual shall be submitted at least ninety (90) days prior to the anticipated completion of the project.

## **PART 2 – PRODUCTS**

Not used.

## **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 40 00**

### **QUALITY REQUIREMENTS**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

###### **A. General:**

1. Local, State and Federal permits to be secured by the General. The Contractor shall comply with the provisions of all such permits, and the cost of all work dictated by such permits shall be included in the prices bid.
2. The Contractor shall give all necessary notices, obtain all permits (except those referenced above) and pay all governmental taxes, fees and other costs in connection with the work (excluding permit fees paid by Owner), file all necessary plans, prepare all documents and obtain all necessary approvals of all governmental departments having jurisdiction, obtain all required Certificates of Inspection and Approval for the work and deliver same to the Architect, except as otherwise noted herein.

**B. Compliance:** All materials furnished and all work installed shall comply with the requirements of all governmental departments having jurisdiction, as well as guidelines from the National Flood Insurance Program (NFIP) and the Federal Emergency Management Agency (FEMA). Comply with the following NFIP regulations as outlined in the Code of Federal Regulations (CFR):

1. 44 CFR § 60.3 - Floodplain Management Criteria for Flood-Prone Areas: Adherence to these criteria is required to ensure the community's continued participation in the NFIP.
2. 44 CFR § 60.6 - Variances and Exceptions: Variances from the floodplain management regulations must comply with the requirements outlined in this section.

##### **1.02 STANDARDS**

**A.** Any reference to standards in the Contract Documents shall always refer to the latest issue in effect, including all revisions at the time bids are taken, of said standards unless otherwise stated.

##### **1.03 VERIFICATION OF DIMENSIONS**

A. The Contractor shall be responsible for field verification of all dimensions of existing facilities and other items which are shown on the Contract Drawings.

B. The Contractor shall be responsible for cross checking dimensions between different drawings as facilities are being laid out. Any discrepancies shall immediately be brought to the attention of the Architect.

## **PART 2 – PRODUCTS**

Not used.

## **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# DIVISION 1 – GENERAL REQUIREMENTS

## SECTION 01 42 00

### REFERENCES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Where "as shown", "as indicated", "as detailed", or words of similar import are used, it is understood that reference to the drawings accompanying this specification is made unless stated otherwise.
- B. Where "as directed", "as required", "as selected", "permitted", "acceptance", or words of similar import are used, it is understood that direction, requirement, selection, permission or acceptance by the Architect and compliance with codes and regulations are intended unless stated otherwise.
- C. Where used "provide" is understood to mean "provide complete in place"; that is "furnished and installed".
- D. Where "items of material, equipment, work, etc." and "methods of installation, finish, and accomplishment, etc." are referred to in this specification it is understood to refer to all such "items, materials, equipment, work, finish, etc."
- E. Where "includes" is used, it is understood to mean "includes, but is not limited to".
- F. Where "Engineer" and "Architect" are used, they shall be understood to have the same meaning and to be the same reference.

##### 1.02 SPECIFICATION REFERENCE

- A. Materials or operations specified by reference to specification of a manufacturer or society or institute or other standard must comply with requirements of current specification or standard listed.
- B. In case of conflict between referenced specification or standard, the one having the more stringent requirement governs.

### **1.03 INSTITUTE, SOCIETY, ASSOCIATION AND STANDARDS ABBREVIATION**

AAMA	Architectural Aluminum Manufacturer's Association
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWS	American Welding Society
FM	Factory Mutual
FS	Federal Standard
NEC	National Electrical Code
NRCA	National Roofing Contractors Association
OSHA	Occupational Safety and Health Act
SIGMA	Sealed Insulating Glass Manufacturer's Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
UL	Underwriter's Laboratories

Not all of the above names are necessarily referenced in the specifications.

### **PART 2 – PRODUCTS**

Not used.

### **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 43 26**

### **TESTING LABORATORY SERVICES**

#### **PART 1 – GENERAL**

##### **1.01 SECTION INCLUDES**

A. Contractor shall select, employ and pay for services of an Independent Testing Laboratory to perform specified inspection, sampling and testing where specified in the various sections of the specifications.

1. Contractor shall cooperate with laboratory to facilitate execution of its required services.
2. Employment of laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

##### **1.02 LABORATORY DUTIES**

A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction.

1. Comply with specified standards.
2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify Architect of observed irregularities or deficiencies of work or products.

D. Promptly submit five (5) copies of written report of each test and inspection to Architect. Each report shall include:

1. Date issued.
2. Project title and number.
3. Testing laboratory name, address and telephone number.
4. Name and signature of laboratory inspector.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.
7. Date of test.

8. Identification of product and specification section.
9. Location of sample or test in the Project.
10. Type of inspection or test.
11. Results of tests and compliance with Contract Documents.
12. Interpretation of test results, when requested by Architect.

E. Perform additional tests as required by Owner or the Owner.

### **1.03 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY**

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.

### **1.04 CONTRACTOR RESPONSIBILITIES**

A. Cooperate with laboratory personnel and provide access to Work.

B. Furnish incidental labor and facilities:

1. To provide access to Work to be tested and to maintain traffic in order to provide laboratory personnel a safe work site.
2. To obtain and handle samples at Project site or at source of product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

C. Inspection and testing exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor, at no additional cost to the Owner.

## **PART 2 – PRODUCTS**

Not used.

## **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 51 00**

### **TEMPORARY UTILITIES**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Furnishing, installing and maintaining temporary utilities required for construction; remove on completion of work.

##### **1.02 REQUIREMENTS OF REGULATORY AGENCIES**

A. Comply with National Electric Code.

B. Comply with Federal, State and local codes and regulations and with utility company requirements.

#### **PART 2 - PRODUCTS**

##### **2.01 GENERAL**

A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

##### **2.02 TEMPORARY ELECTRICITY AND LIGHTING**

A. Arrange with the power company to provide power required for temporary power and lighting. Charges will be for paid for by the Contractor.

B. Provide adequate artificial lighting for areas of work when natural light is not adequate.

C. Provide and maintain necessary temporary night lighting devices to properly mark hazards and obstructions and to maintain security of property and materials.

## **2.03 TEMPORARY HEAT AND VENTILATION**

- A. Provide temporary heat and ventilation, if necessary, to maintain adequate environmental conditions to facilitate progress of work, to meet specified minimum conditions for installation of materials, and to protect materials and finishes from damage due to temperature or humidity.
- B. Use of portable heaters when required shall be standard approved units complete with controls. Fuel costs shall be paid by Contractor.

## **2.04 TEMPORARY WATER**

- A. Provide and transport water to the site necessary to perform the construction.

## **2.05 SANITARY FACILITIES**

- A. Provide temporary sanitary facilities in compliance with laws and regulations.
- B. Service, clean and maintain facilities and enclosures.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Maintain and operate systems to assure continuous service.
- B. Modify and extend systems as work progress requires.

### **3.02 REMOVAL**

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.
- C. Restore existing facilities used for temporary services to specified, or to original, condition.

**END OF SECTION**

## **DIVISION 1 – GENERAL REQUIREMENTS**

### **SECTION 01 52 13**

#### **FIELD OFFICES AND SHEDS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Furnish, install and maintain temporary field office and storage sheds during construction period.
- B. At completion of work, remove field offices, sheds and contents.

###### **1.02 REQUIREMENTS OF REGULATORY AGENCIES**

- A. Comply with requirements of Federal, State and local codes and regulations.

###### **1.03 OTHER REQUIREMENTS**

- A. Prior to installation of offices and sheds, consult with Owner on location, access and related facilities.

##### **PART 2 – PRODUCTS**

Not used.

##### **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 54 00**

### **CONSTRUCTION AIDS**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Furnishing, installing and maintaining construction aids; remove on completion of work.

##### **1.02 SAFETY REQUIREMENTS**

A. Except as modified by governing codes and by this Specification comply with applicable provisions and recommendations of following standards.

1. ANSI A10.2, Safety Code for Building Construction.
2. ANSI A10.8, Safety Requirements for Scaffolding.
3. ANSI A10.10, Safety Requirements for Temporary and Portable Space Heating Devices and Equipment Used in the Construction Industry.
4. ANSI A14.2, Safety Requirements for Portable Metal Ladders.

B. Comply with Federal, State and local codes and regulations.

C. Upon request, contractor shall furnish written certification that he has adhered to the referenced standards in the performance of his work on this project.

#### **PART 2 - PRODUCTS**

##### **2.01 CONSTRUCTION AIDS**

A. Provide and maintain in good condition required temporary ladders, ramps, chutes, scaffolding, and platforms as required.

B. Temporary Enclosures: Provide as required for protecting the work. Provide for both exterior and interior openings, for passageways, and any other location where temporary enclosures and protection may be required.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. Review site conditions and factors which affect construction procedures and construction aids.

### **3.02 GENERAL**

A. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Owner.

### **3.03 REMOVAL**

A. Completely remove temporary materials, equipment and services at completion of project.

B. Clean, repair damage caused by installation or by use of temporary facilities.

C. Restore existing facilities used for temporary purposes to specified, or to original, condition.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 56 00**

### **TEMPORARY BARRIERS AND ENCLOSURES**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Furnishing, installing and maintaining suitable barriers as required to prevent entry, and to protect the work and existing facilities from construction operations; remove when no longer needed, or at completion of work.

##### **1.02 REQUIREMENTS OF REGULATORY AGENCIES**

A. Comply with federal, state and local codes and regulations.

#### **PART 2 - PRODUCTS**

##### **2.01 MATERIALS**

A. Materials may be new or used, suitable for the intended purpose, and shall comply with the requirements of applicable codes and standards.

##### **2.02 BARRIERS**

A. Contractor's option, as appropriate to serve the required purpose.

#### **PART 3 - EXECUTION**

##### **3.01 GENERAL**

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for the required purposes.

B. Maintain during entire construction period.

C. Relocate as required by progress of construction.

### **3.02 REMOVAL**

A. Completely remove barricades when construction has progressed to the point that they are no longer needed, and when approved by the Architect.

B. Clean and repair damage caused by installation.

**END OF SECTION**

## **DIVISION 1 – GENERAL REQUIREMENTS**

### **SECTION 01 58 13**

#### **TEMPORARY PROJECT SIGNAGE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Project identification sign will be furnished and installed by the Contractor.
- B. Remove signs on completion of construction.
- C. Contractor is responsible for securing and paying for all sign permits.

###### **1.02 PROJECT IDENTIFICATION SIGN**

- A. One painted sign of not less than 32 square feet in area (4 feet by 8 feet minimum) with painted graphic content to include:
  - 1. Title of Project.
  - 2. Rendering of Project as provided by the Architect.
  - 3. Name of Owner.
  - 4. Corporate Logo of Owner.
  - 3. Names and titles of:
    - a. Architect.
    - b. Professional Consultants.
  - 4. Prime Contractor.
  - 5. Source of Funds.
- B. Submit layout drawing for approval prior to fabrication.
- C. Erect at site as directed by Owner.
  - 1. Bolt to 4" x 6" by 8'-0" long pressure treated wood posts, two per sign. Posts embed into earth 42 inches.

##### **PART 2 - PRODUCTS**

(NOT USED)

**PART 3 – EXECUTION**

(NOT USED)

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 74 00**

### **CLEANING AND WASTE MANAGEMENT**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.

##### **1.02 DISPOSAL REQUIREMENTS**

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

#### **PART 2 - PRODUCTS**

##### **2.01 MATERIALS**

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer on the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

#### **PART 3 - EXECUTION**

##### **3.01 DURING CONSTRUCTION**

A. Execute daily cleaning to keep Work, site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from renovation operations.

B. Provide on-site containers for collection of waste materials, debris and rubbish.

C. Remove waste materials, debris and rubbish from site periodically and dispose of at legal disposal areas away from site.

### **3.02 FINAL CLEANING**

A. Employ skilled workmen for final cleaning.

B. Remove mastic, adhesives, dust, dirt, stains, fingerprints, labels and other foreign materials from sight-exposed interior and exterior surfaces.

C. Wash and shine glazing.

D. Polish glossy surfaces to a clear shine.

E. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

F. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.

**END OF SECTION**

# **DIVISION 1 - GENERAL REQUIREMENTS**

## **SECTION 01 77 00**

### **CONTRACT CLOSEOUT**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Substantial Completion: The project will be considered substantially complete when the building and all equipment has been completed, installed and tested and the building is ready to be used for its intended use.

##### **1.02 CLEANUP**

A. Upon completion of the work and before Final Acceptance will be made, the work site, storage areas, and other areas occupied by the Contractor during construction shall be cleaned, and all surplus and discarded materials, false work and rubbish placed thereon by the Contractor shall be removed by the Contractor. The Contractor's storage area shall be top soiled, seeded and mulched. No separate payment will be made for the work as all such costs shall be included in the lump sum price bid.

##### **1.03 TOOLS, ACCESSORIES AND SPARE PARTS**

A. The Contractor shall, unless otherwise stated, furnish with each type, kind and size of equipment, one complete set of any special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment.

B. Each piece of equipment shall be provided with a substantial name plate, which is securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture and principal rating data.

C. Where the Specifications require spare parts to be furnished by the Contractor, said spare parts for each item of equipment shall be kept separate and tagged to identify the specific item of equipment to which they belong, shall be packaged so as to preclude damage from handling and storage, and shall be bagged or packaged together where items are small in dimension.

##### **1.04 DELAYS AND EXTENSIONS OF TIME**

A. 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.

B. The Contractor shall not be entitled to payment or compensation of any kind from the Owner for direct, indirect or impact damages, including but not limited to costs of acceleration arising because of hindrance or delay from any cause whatsoever, whether such hindrances or delays be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable; provided, however, that this provision shall not preclude recovery by the Contractor of damages for hindrances or delays due solely to fraud or bad faith on the part of the Owner or his agents.

C. In the event the Contractor requests an extension of the Contract Time, he shall furnish such justification and supporting evidence as the Owner may deem necessary for a determination of whether or not the Contractor is entitled to an extension of time under the provisions of the Contract. The Owner shall base his findings of fact and decision on such justification and supporting evidence and shall advise the Contractor in writing thereof. If the Owner finds that the Contractor is entitled to any extension of the Contract Time, the Owner's determination of the total number of days' extension shall be based upon the currently approved progress schedule and on all data relevant to the extension. Such data will be incorporated into the schedule in the form of a revision thereto, accomplished in a timely manner. The Contractor acknowledges and agrees that the actual delays in activities or time that are required to execute change order activities which, according to the schedule, do not affect the critical path and therefore do not have any effect upon Contract completion time, will not be a basis for an extension of time.

#### **1.05 WARRANTY AND GUARANTEE**

A. After the project is substantially complete and the Architect has issued the Certificate of Substantial Completion, all guarantees and warranties shall commence.

B. The Contractor warrants to the Owner the following for a period of one year:

1. That all materials and equipment provided under this Contract are new, unless otherwise specified.
2. That all work is of good quality and free from faults and defects and in accordance with the requirements of the Contract Documents.
3. That all equipment and systems and each and every part thereof, shall operate (with proper care and attention) in a satisfactory and efficient manner, and in accordance with the Contract Documents.
4. That the Contractor shall, upon receipt of written notice from the Owner, promptly replace with workmanship and materials which comply with these Specifications, and re-execute, correct or repair, without cost to the Owner, all work which may be found to be not in accordance with the Contract Documents.
5. That the guarantee obligations assumed by the Contractor under these

Contract Documents shall not be held or taken to be in any way impaired because of the Specifications, indication or approval by or on behalf of the Owner of any articles, materials, means, combinations of things used or to be used in the construction, performance and completion of the work, or any part thereof.

6. That no use or acceptance by the Owner of the work or any part thereof, nor any failure to use the same, nor any repairs, adjustments or corrections made by the Owner due to the Contractor's failure to comply with any of his obligations under the Contract Documents, shall impair in any way the guarantee obligations of the Contractor under these Contract Documents.

C. If the Contractor fails to make repairs during the guarantee period, the Owner may cause such damaged or defective work to be repaired and made good at the cost and expense of the Contractor, including, but not limited to, compensation if required for additional professional Contractors. The Contractor shall also bear the expenses of making good all work destroyed or damaged by the correction, removal or replacement of his defective work.

## **1.06 TESTING OF EQUIPMENT AND SYSTEMS**

### **A. Preliminary Testing**

1. When the Contractor has completed the installation of all equipment including electrical appurtenances, he shall perform preliminary testing on each piece of equipment.
2. Contractor shall provide for the inspection of each piece of equipment by authorized and qualified manufacturer's representatives. These manufacturer's representatives shall verify that all equipment has been installed properly.
3. Manufacturer's representatives shall verify that the individual equipment and/or components are functioning in accordance with the Contract Documents.
4. The manufacturer of each piece of equipment shall provide a manufacturer's certificate in accordance with Section 01300 - SUBMITTALS.

### **B. Pre-Final Testing**

1. Pre-final testing shall include the actual running of equipment to ensure that all electric and controls are properly connected. This testing shall be done under the supervision of the manufacturer's representative.

## **1.07 FINAL ACCEPTANCE**

- A. Upon completion of all work under this Contract, the Contractor shall request, in

writing, final acceptance by the Owner.

B. Prior to this request, all specified operation and maintenance instructions and training shall have been provided for the plant personnel and all certificates, spare parts, test equipment, record drawings, and other items required to be delivered shall have been provided.

C. Upon receipt of the request, the Architect, the Owner, and the Contractor will make an inspection of the Project to determine the status of completion as follows:

1. If the Architect does not consider the Project to be complete, the Architect will notify the Contractor in writing of this fact, and will include the reasons why the Project is not considered complete.
2. Any items that are not satisfactorily completed or unsatisfactory as determined by the Architect, shall be promptly remedied or completed.
3. Upon satisfactory correction of defects or incomplete information or work, the Architect will certify to the Owner that the plant is finally complete.

## **PART 2 – PRODUCTS**

Not used.

## **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

# **DIVISION 1 – GENERAL REQUIREMENTS**

## **SECTION 01 78 39**

### **PROJECT RECORD DOCUMENTS**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Maintain at site one record copy of:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change orders and other modifications to contract.
  - 5. Architect field orders or written instructions.
  - 6. Approved shop drawings, product data and samples.
  - 7. Field test reports.

##### **1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
  - 1. Provide files and racks for storage of documents.
  - 2. Provide secure storage space for storage of samples.
- B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

##### **1.03 MARKING DEVICES**

- A. Provide felt tip marking pens for recording information.

##### **1.04 RECORDING**

- A. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress.
- C. Drawings: Legibly mark to record actual construction.

- D. Specifications and Addenda: Legibly mark each section to record
1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  2. Changes made by Field Order or by Change Order.

#### **1.05 SUBMITTAL**

A. At contract close out, deliver paper and electronic copies of the Record Documents to Architect or Owner as directed. Final payment will not be due and payable until acceptable Record Documents are submitted to the Architect.

B. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Title and number of each Record Document.
5. Signature of Contractor or his authorized representative.

#### **PART 2 – PRODUCTS**

Not used.

#### **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

## **DIVISION 02 - SITE WORK**

### **SECTION 02 30 00**

#### **SUBSURFACE EXPLORATION**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Test Boring Logs: The test boring logs included herein are for the information of the Town of Dewey Beach, and in no way is this information to be considered part of the contract. Neither the Owner nor the Architect warrants or guarantees that the materials and conditions actually encountered in the prosecution of the work will be the same as shown in the test borings. If the contractor relies for any purpose upon said information, he does so at his own risk.

B. Prior to submitting his Bid, the Bidder shall make his own investigations of the on-site conditions and materials and shall base his Bid upon his own findings. The Owner will not approve any request for change order based upon the contention that subsurface conditions or materials vary from those indicated on the Drawings. The Contractor's bid shall be based upon his own investigation of these materials and conditions.

##### **1.02 EXISTING SUBSURFACE LINES**

A. All known subsurface lines, pipes, conduits, and structures are shown on the drawings. The lines shown are based upon the best available plans and maps. The locations have not been verified by test pits and the Architect and the Owner assume no responsibility for the accuracy of the Drawings. In any area where the Contractor must make connections to or cross existing lines, it shall be his responsibility to test pit the lines and verify the locations to his satisfaction. In the event that lines are not found located as shown on the plans, the Contractor shall notify the Architect so that an evaluation can be made as to the magnitude and method of any adjustments in the plans.

1. Certain locations on the Contract Drawings are noted to be test pitted. The elevations of the pipelines at these locations are critical, and thus, these locations should be test pitted as soon as possible after the Notice to Proceed. The cost of these test pits shall be included in the lump sum price bid.

B. The Contractor shall be required to verify the location and depth of all critical lines using test pits before beginning work.

C. The Contractor shall be solely responsible for any damage to any underground or aboveground lines encountered in any manner during construction. When crossing and working in the vicinity of existing lines it will be the Contractor's responsibility to properly support and maintain the operation of the lines. Extreme care must be exercised in excavation and refill operations. The Contractor will correct at his own expense any damage caused to existing lines.

## **PART 2 - PRODUCTS**

Not used.

## **PART 3 - EXECUTION**

Not used.

**END OF SECTION**

# GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND  
ENVIRONMENTAL CONSULTANTS

*A Practicing Geoprofessional Business Association Member Firm*



October 6, 2023

George, Miles & Buhr, LLC  
206 West Main Street  
Salisbury, Maryland 21801

Attn: Ms. Morgan H. Helfrich, A.I.A.  
Senior Vice President/Group Leader/Project Director

Re: Report of Geotechnical Exploration  
***Dewey Beach Town Hall***  
105 Rodney Avenue  
Dewey Beach  
Sussex County, Delaware

Ladies and Gentlemen:

In accordance with our agreement dated March 29, 2023, Geo-Technology Associates, Incorporated (GTA) has completed a geotechnical exploration for the Dewey Beach Town Hall project located in Dewey Beach, Delaware. The exploration consisted of performing Cone Penetration Test (CPT) soundings at two locations. Transmitted herein is a report of our findings and conclusions regarding preliminary recommendations for building foundation and slab support.

Unless George, Miles & Buhr, LLC specifies otherwise, the samples collected as a part of the subsurface exploration will be disposed of after a period of 60 days from the date of this report. Thank you for the opportunity to be of assistance.

Sincerely,  
**GEO-TECHNOLOGY ASSOCIATES, INC.**

Travis Caraway, P.E.  
Associate

Gregory R. Sauter, P.E.  
Vice President



TPC/GRS/llh 31231674

21491 Baltimore Avenue, Unit 1, Georgetown, DE 19947 (302) 855-9761

◆ ABINGDON, MD ◆ BALTIMORE, MD ◆ LAUREL, MD ◆ FREDERICK, MD ◆ WALDORF, MD ◆ NEW CASTLE, DE ◆ GEORGETOWN, DE  
◆ SOMERSET, NJ ◆ NYC METRO ◆ PITTSBURGH METRO ◆ QUAKERTOWN, PA ◆ SCRANTON/WILKES-BARRE, PA ◆ YORK, PA  
◆ NORTHEASTERN, OH ◆ STERLING, VA ◆ NASHVILLE, TN ◆ CHARLOTTE, NC ◆ RALEIGH, NC ◆ GREENVILLE, SC ◆ ORLANDO, FL



## REPORT OF GEOTECHNICAL EXPLORATION

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### **Dewey Beach Town Hall**

**Dewey Beach  
Sussex County, Delaware**

October 6, 2023

Prepared For:

**George, Miles & Buhr, LLC**

206 West Main Street  
Salisbury, Maryland 21801

Attn: Ms. Morgan H. Helfrich, A.I.A.  
Senior Vice President/Group Leader/ Project Director

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Prepared By:

**GEO-TECHNOLOGY ASSOCIATES, INC.**

*Geotechnical and Environmental Consultants*

21491 Baltimore Avenue, Unit 1

Georgetown, Delaware 19947

(302) 855-9761

GTA Job No: 31231674

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**REPORT OF GEOTECHNICAL EXPLORATION  
DEWEY BEACH TOWN HALL  
DEWEY BEACH  
SUSSEX COUNTY, DELAWARE  
OCTOBER 2023**

**INTRODUCTION**

A three-story government services building is proposed at 105 Rodney Avenue in Dewey Beach, Delaware. The building users will include the Town of Dewey Beach administration, EMS and police personnel. Geo-Technology Associates, Inc. (GTA) was retained by George, Miles & Buhr, LLC (GMB) to perform a geotechnical exploration of the site. The scope of this study included field exploration, review of site plans and engineering analysis. The field exploration consisted of two Cone Penetration Test (CPT) soundings and one auger boring located within the area of the proposed building. Conclusions and recommendations about site development were derived from engineering analyses of field data and plans titled *Dewey Town Hall & Police Department* prepared by George, Miles & Buhr, LLC and dated June 20, 2023 and *105 Rodney Avenue & 1503-1505 Coastal Highway, Dewey Beach* prepared by Scaled Engineering and dated August 18, 2022.

**SITE CONDITIONS**

Referring to the Site Location Plan and the Exploration Location Plan included as Figures 1 and 2, respectively in Appendix A, the project site is located at the northwest quadrant of the intersection of Rodney Avenue and Coastal Highway (Route 1) in Dewey Beach, Delaware. Residential buildings border the site to the south and west and commercial buildings border the site to the north and east. The project site is comprised of three relatively flat, generally rectangular-shaped parcels with local government buildings. The ground surface of the lots is at approximate Elevation 3 to 4 Mean Sea Level (MSL), as estimated from the referenced plans.

**PROPOSED CONSTRUCTION**

The proposed construction will consist of a three-story building with first floor slab-on-grade construction, second floor Post-Tensioned concrete deck and a framed third floor. The first floor will be constructed at a level of approximately 3 feet 8 inches above the existing grade. The proposed building will have a footprint of approximately 8,750 square feet and preliminary building loads are

estimated to range upwards to 5 kips per foot for wall loads and 350 kips for interior column loads. GTA should review the final building loads when available to allow for additional recommendations, if required, based upon the actual loads. With the proposed first floor elevation, the building pad will require approximately 3½-feet of structural fill to achieve building slab subgrade. Outside of the EMS ramp area, GTA assumes grades will remain relatively unchanged. The building will be served by public water and sewer.

### **SITE GEOLOGY**

According to the Geologic Map of the Fairmount and Rehoboth Beach Quadrangles, Delaware (2011) published by the Delaware Geological Survey, the site is within the Coastal Plain Physiographic Province. Coastal Plain sediments below the surficial deposits exposed in the site area were generally deposited in commonly estuarine environments of Tertiary and Quaternary geologic ages. The Holocene deposits are designated as the Barrier Washover Deposits and typically consist of, "... very coarse to fine sand with scattered laminar of pebbles and heavy mineral laminae. Laminae of organic fragments and thin peats layers are also common." Underlying the Holocene deposits are the Late Pleistocene deposits designated as the Lynch Heights formation. The soils of the Lynch Heights formation generally consist of, "well-sorted, fine to coarse sand with scattered very coarse to pebble laminae and silty clay laminae overlying light-gray to greenish-gray, compact silty clay with rare laminae of *Mulina* shells and shell fragments." Please refer to the publication for additional information. Man-made fill is anticipated at this site.

### **SUBSURFACE EXPLORATION**

The field exploration consisted of performing Cone Penetration Test (CPT) soundings at two locations, designated as CPT-1 and CPT-2, and one offset auger boring, designated as B-1, in the area of the proposed building footprint. The soundings were advanced at the approximate locations shown on the Exploration Location Plan, presented as Figure 2 in Appendix A. The exploration locations were selected and field located by GTA tape measuring from on-site features. The exploration locations indicated on the plan should be considered approximate. Ground surface elevations were estimated from the referenced plans.

The soundings were advanced on September 12, 2023, to depths of 73 feet below the existing ground surface. The CPT soundings were performed using a 10-ton, 10 cm<sup>2</sup> single-element Hogentogler cone capable of measuring pore pressures at the u<sub>2</sub> position. The soundings were performed by pushing an electronically instrumented cone shaped probe into the soil with the hydraulic system of a track- mounted reaction device. The cone is equipped with an instrumented tip and friction sleeve that measures tip resistance and soil-to-steel friction, respectively, as the cone is being pushed. In addition, the pore water pressure response to cone penetration is measured. Measurements of tip resistance, sleeve friction, and pore pressure were taken at approximately 1- inch depth intervals. This data was transmitted via computer to recording devices at the ground surface. Graphical cone sounding logs were constructed to show the variations of tip resistance, local friction, friction ratio, and pore pressure with depth. When properly interpreted, these values are an index to soil strength, compressibility, and classification. The tip resistance profile graphically presents the relative strength of the soil strata. The friction ratio, the numerical ratio of the local friction to the tip resistance, was computed for each depth interval. This ratio is an indicator of the material type, i.e. sand, silt, or clay. The friction, friction ratio, and pore pressure profiles are used primarily to interpret soil type. Refer to the attached exploration logs for detailed graphical interpretation of the subsurface conditions at each sounding and boring.

### **SUBSURFACE CONDITIONS**

The explorations generally confirm the description of subsurface conditions provided in the *SITE GEOLOGY* section of this report. Below a 1-inch-thick layer of Gravel, the boring encountered a fill layer extending to approximately ½-feet below the ground surface. The fill layer generally consisted of Silty SAND (USCS: SM) with wood debris. Below the fill layer, the borings encountered native soils consisting of Silty SANDs (SM).

Beneath a 2 to 3-inch thick surface layer of bituminous concrete, the soundings predominantly encountered intermixed layers of very loose to medium dense Sand to Silty Sand to Sandy Silt extending to depths of approximately 8 to 14 feet below the ground surface (bgs). Below the Sand to Silty Sand to Sandy Silt layers, the soundings generally encountered a soft Clay extending to depths of approximately 21 to 26 feet bgs, followed by very loose to very dense Sand to

Silty Sand to Sandy Silt extending to approximate depths of 28 to 33 feet bgs. Underlying the Sand to Silty Sand to Sandy Silt layers, the soundings encountered a medium stiff to very stiff Clay layer with interbedded areas of Sand to Silty Sand extending to approximate depths of 55 feet bgs. Beneath the Clay layer, generally medium dense to very dense Sand to Silty Sand to Sandy Silt layers were encountered extending to sounding terminations of approximately 73 feet.

Water levels encountered during the exploration program were at depths of 2.7 to 3.4 feet below the ground surface when logged at completion, corresponding to approximate Elevation 0 MSL. Longer-term water readings taken one day after completion were recorded at depths of 2.3 to 2.8 feet below the ground surface, corresponding to approximate Elevations 0 to 1 MSL.

Groundwater levels can be expected to fluctuate with tidal changes, seasonal changes, precipitation, and other factors such as development activity. Please refer to the exploration logs provided in Appendix B for further information.

**LABORATORY TESTING**

A selected sample obtained from the boring was tested for grain-size analysis, Atterberg Limits, moisture density relationship, and natural moisture content. The grain-size analysis and Atterberg Limits testing were performed to identify the Unified Soil Classification System (USCS) designation for the soil. The results of testing are as follows:

**SUMMARY OF LABORATORY TESTING**

<b>EXPLORATION NO.</b>	<b>DEPTH (FT.)</b>	<b>USCS CLASSIFICATION</b>	<b>LL (%)</b>	<b>PI (%)</b>	<b>NM (%)</b>
B-1	1 – 4	Silty SAND (SM)	NP	NP	13.7

Note: LL=Liquid Limit PI=Plastic Index NP=Non-plastic NM=Natural Moisture Content

Please refer to the laboratory test results included within Appendix C for additional information.

**CONCLUSIONS AND RECOMMENDATIONS**

Based upon the results of this exploration, it is GTA's opinion that the proposed construction is feasible given that the recommendations presented herein are followed and that the standard level of care is taken during construction. Shallow groundwater will impact proposed construction. GTA's preliminary recommendations regarding the proposed construction are outlined in the following paragraphs.

Based upon the exploration data and proposed building loads, it is GTA's opinion that the three-story building should be supported upon foundation piles extended through the upper materials and into the underlying medium dense to dense sands. GTA recommends driven 12x12-inch precast, prestressed concrete piles or 14-inch or 16-inch diameter pressure grouted auger cast piles.

**Earthwork**

Prior to pile installation and before the placement of compacted fill, areas below proposed foundations, slabs, and pavements should be stripped to remove topsoil, bituminous concrete pavement, demolition debris and soft materials. After stripping, subgrade areas should be proof-rolled with a loaded tandem-axle dump truck, performed as recommended by GTA. No fill should be placed until the geotechnical engineer approves the subgrade. Wet soils near surface grade will result in poor trafficability. Positive drainage should be maintained during construction.

Off-site borrow should meet Unified Soil Classification System (USCS) designation SM, SP, SW, GM, GP, or GW and be approved by GTA. All fills should be constructed in maximum 8-inch thick loose lifts and be compacted to the following specifications:

**COMPACTION SPECIFICATIONS**

<b>Structure / Fill Location</b>	<b>Compaction / Moisture Specification</b>
Below foundations, floor slab subgrades, pavement and within wall backfill	95% of ASTM D 1557 Moisture: $\pm$ 3% of optimum
Lawn or unimproved areas	90% of ASTM D 1557 Moisture: optimum to $\pm$ 3% of optimum

A full-time soils-technician under guidance of GTA should observe fill construction. Compactive effort should be verified by in-place density testing.

It is GTA's opinion that the soil conditions at this site can be preliminarily categorized as Site Class E per the ASCE/SEI Standard 7-22 and the 2021 International Building Code. This categorization is based on the exploration test results, general geologic information for the region, and the information contained in the ASCE/SEI Standard 7-22 and IBC 2021 codes.

### **Driven Prestressed Concrete Piles**

Based on preliminary analysis, it is our opinion, that the 12x12 precast concrete piles may be preliminarily designed for an individual allowable axial load of 50 tons and 20 tons uplift per pile. To achieve the allowed axial load, piles should be driven to estimated depths of 55- to 60-feet below the ground surface.

For prestressed concrete piles, a minimum pile spacing of three times the pile width is recommended. Longer piles should be used to achieve minimum embedment depths as required by the structural engineer and as needed to achieve the allowable capacity per pile. Piles may be spliced using approved pile connection devices.

A minimum of two control (i.e., test probe) piles should be driven at production pile locations to better estimate production pile lengths and any additional driving criteria. Where practical, test probe piles should be at least five feet longer than the estimated production pile lengths so that adjustments can be made in the field based on driving results. The same hammer used to drive test probe piles should be used for driving production piles. Driving criteria should be established by means of the Modified Engineering News Formula or the Gates Equation based on the type of hammer used and PDA testing. Pile re-strike several days after installation may be required if the soils become agitated during driving operations as a result of rapid pile penetration into the saturated sands. The need for pile re-strike can best be determined in the field at the time of pile installation. GTA should be consulted prior to driving any pile deeper than 65 feet below the ground surface.

Field observation by the Geotechnical Engineer or his designated representative should be provided during installation of the test probe and production piles. The purpose of the pile installation observation is to verify the pile dimensions and installation depth, and to confirm that the allowable pile capacity was achieved. These observations will be important for making adjustments to the pile tip elevations or other recommendations given herein, especially during test probe pile installation. Production piles should not be delivered until the test probe pile program is complete and a successful pile load test has been achieved. The production pile installation should be observed by GTA for conformance with plans and specifications.

### **Pressure Grouted Auger Cast Piles**

Pressure grouted auger-cast piles extending through the upper materials and bearing in the underlying medium dense to dense native sands may also be used to provide foundation support. Based on our preliminary analysis, GTA recommends an allowable load of 50 tons per pile for a 14-inch diameter pile installed to an estimated length of 60 to 65 feet. For a 16-inch diameter pile, an allowable load of upwards to 75 tons may be used for a pile installed to an estimated length of 60 to 65 feet. Full length reinforcing steel and grout strength should be evaluated by the structural engineer. Adjacent piles should not be placed on the same day; rather the grout should be allowed to cure prior to constructing adjacent piles. A minimum pile spacing of three times the pile diameter is recommended.

Other pile types may also be feasible for the proposed foundation. GTA will evaluate other pile types, upon request.

### **Pile Load Test**

A load test will be required to verify pile capacities and adjust length as appropriate. Load testing of the pile to twice the design capacity is recommended. The pile load test should be performed in accordance with ASTM D1143. The load test and production pile installation should be monitored by GTA.

### **Ancillary Structures**

Based upon the exploration data, it is GTA's opinion that the ancillary structures may be supported on structural fill or firm native soils using shallow spread footings designed for a maximum net allowable bearing pressure of 2,000 pounds per square foot (psf) or mat foundation designed for a modulus of subgrade reaction value (ks) of 75 kips per cubic foot (kcf). Minimum widths for wall footings of 16 inches and column footings of 24 inches are recommended. Exterior footings should be founded a minimum of 24 inches below the final exterior grades to provide protection from frost action.

Detailed foundation evaluations should be performed in each footing excavation prior to the placement of reinforcing steel or concrete. These evaluations should be performed by a representative of the GTA to confirm that the allowable soil bearing capacity is available. The foundation bearing surface evaluations should be performed using a combination of visual observation, comparison with the borings, hand-rod probing, and Dynamic Cone Penetrometer (DCP) testing. Concrete should be placed on the day the footings are excavated.

The foundation contractor should anticipate dewatering to facilitate construction in excavations extending near or below groundwater. Excavations extending below groundwater will require dewatering using sump pumps/pits with deeper excavations possibly requiring well points.

### **Ground Slabs**

The three-story building ground floor slabs, stoops and ramps should be designed as a structural slab/mat supported on the pile foundation.

Ancillary structure slabs may be designed as concrete slab-on-grade. Natural and compacted fill subgrades for support of the floor slabs should be tested to verify stability and compaction in accordance with GTA's earthwork recommendations prior to placement of concrete. A modulus of subgrade reaction value of 150 psi per inch is recommended for the design of isolated ground slabs.

GTA recommends that the ground concrete floor slabs be founded on a four-inch thick open-graded washed gravel or stone layer covered with a polyethylene vapor retarder to interrupt the rise of moisture through the slab.

### **Below Grade Walls**

Below grade walls, should be designed to resist lateral earth pressures and be provided with a properly outletted drain system in an effort to minimize the buildup of hydrostatic pressure from natural or unnatural sources following construction. An appropriate surface surcharge should be considered in the design to reflect the uses of the areas adjacent to the walls following construction. GTA recommends that the following soil design parameters be used for the design of the walls:

Friction Angle	$\phi = 30$ degrees
Active Pressure Coefficient*	$K_a = 0.33$
At Rest Pressure Coefficient*	$K_o = 0.5$
Passive Pressure Coefficient*	$K_p = 3.0$
Moist Unit Weight of Soil	125 pcf
Saturated Unit Weight of Soil	130 pcf
Submerged Unit Weight of Soil	68 pcf
Design Groundwater Elevation	2 MSL
*Level backfill condition	

Soil used for backfill against below grade walls should be non-plastic and have less than 20 percent passing the No. 200 sieve. Select borrow material meeting these requirements may need to be borrowed from other areas of the site or imported from an approved borrow source. Select borrow material used for the walls should be approved by GTA for the intended usage.

### **ADDITIONAL SERVICES**

We recommended that GTA be retained to provide observation and testing services for the following items.

- Review final plans to evaluate if they conform to the intent of this report.
- Provide observation and testing services during fill placement to evaluate if the work is being performed in accordance with the project specifications and intent of this report.

- Observe the proof-rolling of pad and pavement subgrades prior to placing fill or base course to evaluate stability.
- Observe the production pile installation and load testing for conformance with plans and specifications.
- Review excavated footings for compliance with the project drawings and the intent of this geotechnical report.
- Provide Special Inspections as required by the project plans and specifications and local jurisdictional officials.

### **LIMITATIONS**

This report, including all supporting boring logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by GTA in connection with this project have been prepared for the exclusive use of George, Miles & Buhr, LLC pursuant to agreements between GTA and George, Miles & Buhr, LLC in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions appended thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA and George, Miles & Buhr, LLC is unauthorized and such use is at the sole risk of the user.

The analysis and preliminary recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test borings indicate soil conditions only at specific locations and times and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology

Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc. The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client.

This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

**31231674**

**GEO-TECHNOLOGY ASSOCIATES, INC.**

# Important Information about This

# Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

**The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.**

## Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

## Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it.* A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

## Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

## You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

### Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

### This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

### This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

### Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

*conspicuously that you’ve included the material for information purposes only.* To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

### Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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 personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

### Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* **Confront the risk of moisture infiltration** by including building-envelope or mold specialists on the design team. **Geotechnical engineers are not building-envelope or mold specialists.**



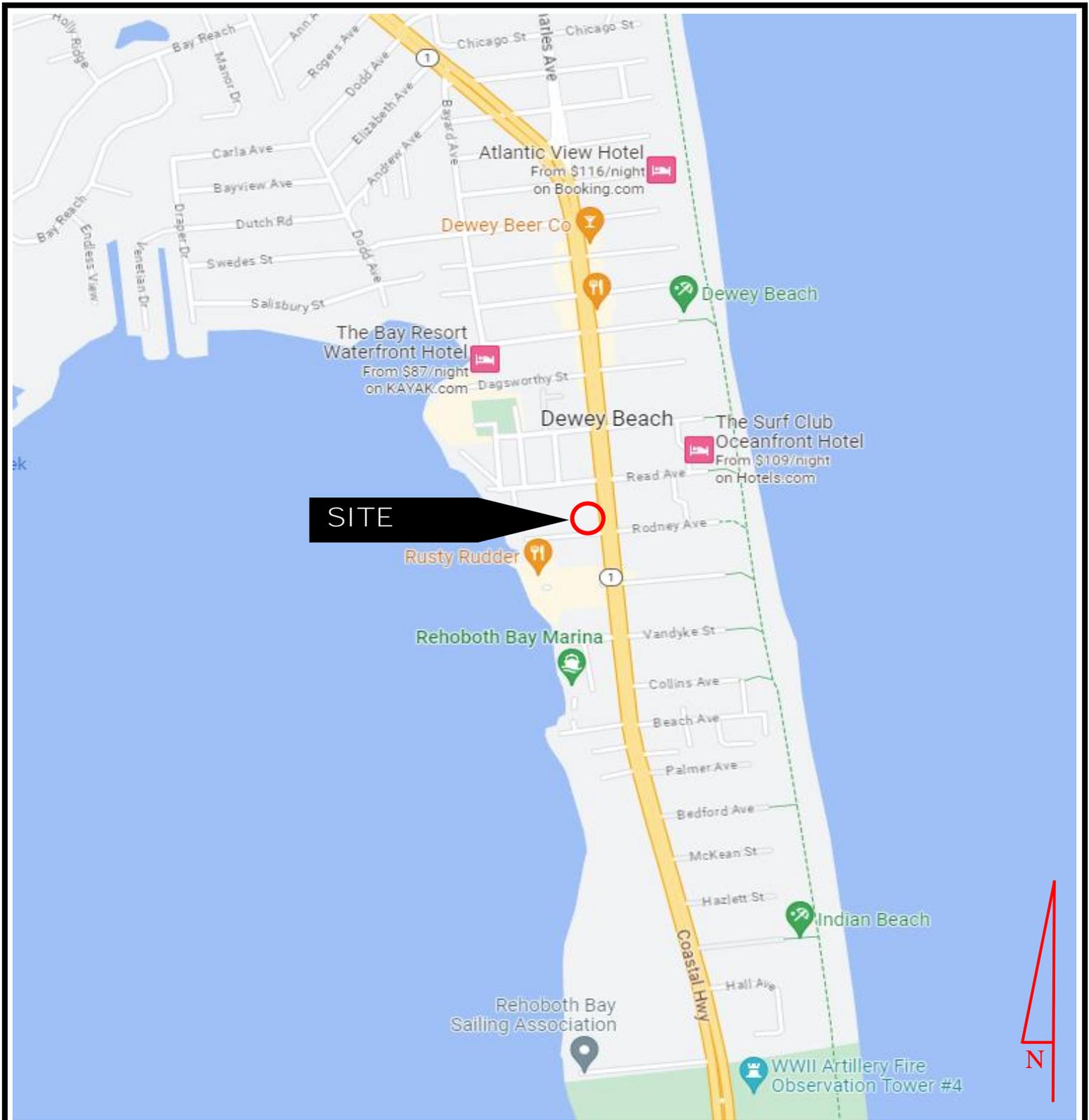
Telephone: 301/565-2733

e-mail: [info@geoprofessional.org](mailto:info@geoprofessional.org) [www.geoprofessional.org](http://www.geoprofessional.org)

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# **APPENDIX A**

## **FIGURES**



Site Location Plan taken from Google Maps



**GEO-TECHNOLOGY ASSOCIATES, INC.**  
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS  
 21491 Baltimore Avenue  
 Georgetown, Delaware 19947  
 (302) 855-9761

**Site Location Plan**  
**Dewey Beach Town Hall**  
**Dewey Beach, Delaware**

SCALE  
 NTS

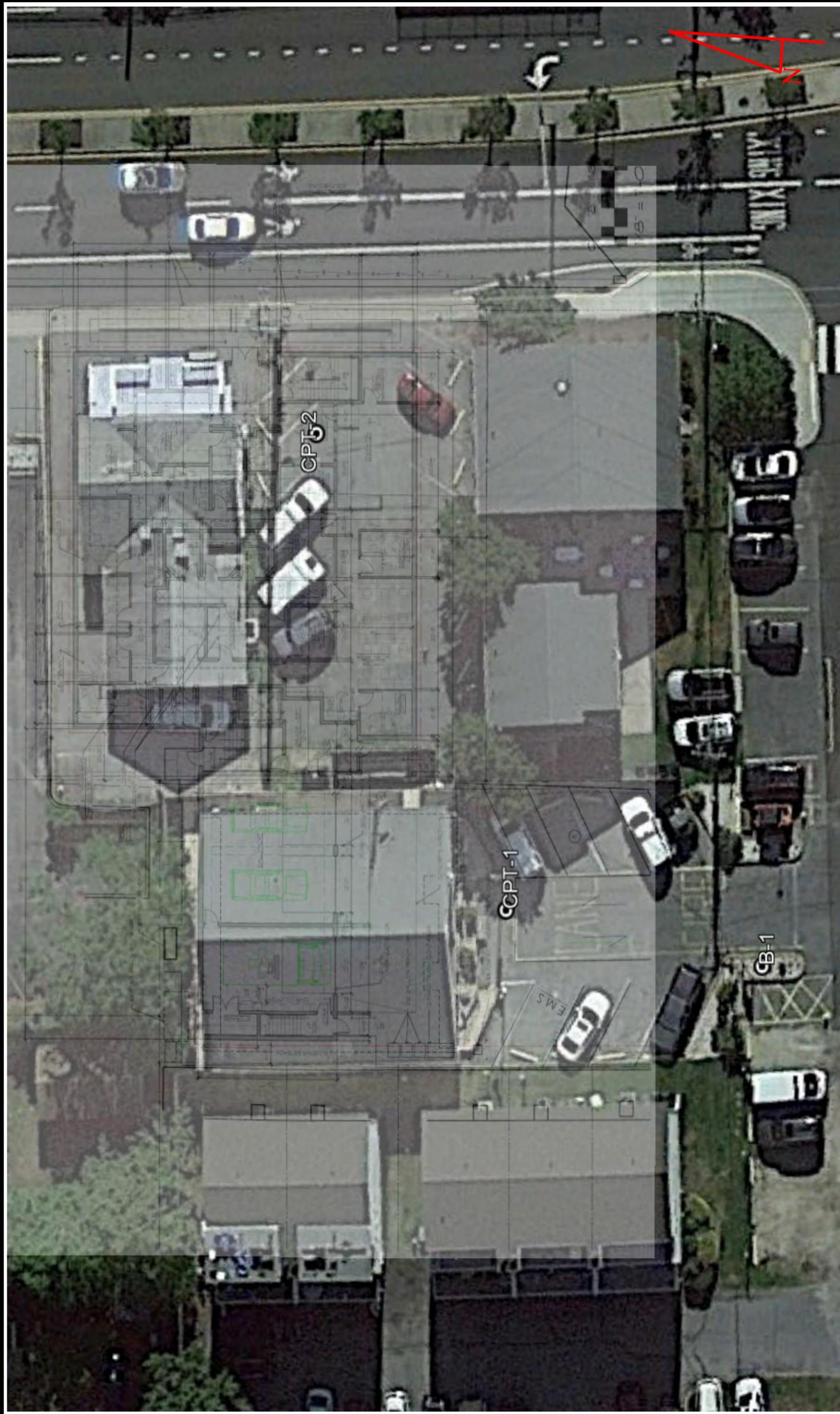
DATE  
 September 2023

DRAWN BY  
 GTA

DESIGN BY  
 Google Maps

REVIEW BY  
 GRS

JOB NO.  
 31231674



Exploration Location Plan taken from Google Earth and a site plan titled Dewey Town Hall & Police Department prepared by George, Miles & Buhr, LLC and dated June 20, 2023.

● Exploration Location



**GEO-TECHNOLOGY ASSOCIATES, INC.**  
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS  
 21491 Baltimore Avenue, Unit 1  
 Georgetown, Delaware 19947  
 (302) 855-9761

**Exploration Location Plan**  
**Dewey Beach Town Hall**  
**Dewey Beach, Delaware**

SCALE 11X17	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.	Figure
1" ~20'	September 2023	GTA	GMB	GRS	31231674	2

**APPENDIX B**  
**EXPLORATION DATA**

# NOTES FOR EXPLORATION LOGS

## KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS		
			GRAPHIC	LETTER	
<b>COARSE-GRAINED SOILS</b>  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	<b>GRAVEL AND GRAVELLY SOILS</b>  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	<b>CLEAN GRAVELS</b>  (LESS THAN 15% PASSING THE NO. 200 SIEVE)		GW	
		<b>GRAVELS WITH FINES</b>  (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GP	
	<b>SAND AND SANDY SOILS</b>  MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	<b>CLEAN SANDS</b>  (LESS THAN 15% PASSING THE NO. 200 SIEVE)		GM	
				GC	
		<b>SANDS WITH FINES</b>  (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SW	
				SP	
<b>FINE-GRAINED SOILS</b>  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	<b>SILT OR CLAY</b> (<15% RETAINED ON THE NO. 200 SIEVE)  <b>SILT OR CLAY WITH SAND OR GRAVEL</b> (15% TO 30% RETAINED ON THE NO. 200 SIEVE)	<b>SILTS AND LEAN CLAYS</b>  LIQUID LIMIT LESS THAN 50		SM	
				SC	
		<b>SANDY OR GRAVELLY SILT OR CLAY</b> (>30% RETAINED ON THE NO. 200 SIEVE)	<b>ELASTIC SILTS AND FAT CLAYS</b>  LIQUID LIMIT GREATER THAN 50		ML
					CL
	<b>HIGHLY ORGANIC SOILS</b>	<b>SANDY OR GRAVELLY SILT OR CLAY</b> (>30% RETAINED ON THE NO. 200 SIEVE)		OL	
				MH	
				CH	
				OH	
			PT		

### COARSE-GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

### FINE-GRAINED SOILS (SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:  
 WOH = WEIGHT OF HAMMER  
 WOR = WEIGHT OF ROD(S)

### SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

## ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

<b>ADDITIONAL DESIGNATIONS</b>	DESCRIPTION		GRAPHIC SYMBOLS
	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
<b>RESIDUAL SOIL DESIGNATIONS</b>  220242.A0	DESCRIPTION	"N" VALUE	GRAPHIC SYMBOLS
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" OF PENETRATION OR LESS, AUGER PENETRABLE	

### WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	
UPON COMPLETION OF DRILLING	
24 HOURS AFTER COMPLETION	

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

# LOG OF EXPLORATION NO. B-1

Sheet 1 of 1

PROJECT: **Dewey Beach Town Hall**  
 PROJECT NO.: **31231674**  
 PROJECT LOCATION: **Dewey Beach, Delaware**

WATER LEVEL (ft):  $\nabla$  2.1      $\nabla$  \_\_\_\_\_      $\nabla$  1.8  
 DATE: 9/14/23     \_\_\_\_\_     9/15/23  
 CAVED (ft): \_\_\_\_\_     \_\_\_\_\_     \_\_\_\_\_

DATE STARTED: **9/14/2023**  
 DATE COMPLETED: **9/14/2023**  
 DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**  
 DRILLER: **A. Wood**  
 DRILLING METHOD: **Auger**  
 SAMPLING METHOD: **Discrete**

GROUND SURFACE ELEVATION: **3**  
 DATUM: **Topo**  
 EQUIPMENT: **Hand Auger**  
 LOGGED BY: **AMW**  
 CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE BLOWS/ $1\frac{3}{4}$ inches	DCP (see notes)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
				3.0	0	GP		Gravel: 1 inch	
				2.9		FILL		Black-brown, moist, Silty SAND with Wood debris (Fill)	
				2.5		SM		Dark brown, moist to wet, Silty SAND	
					1				
					2				$\nabla$ $\nabla$
					3				
				-1.0	4			Bottom of hole 4 feet	Wet, caving conditions met at 4 feet
					5				
					6				

NOTES:



**GEO-TECHNOLOGY ASSOCIATES, INC.**

21491 Baltimore Avenue, Suite 1  
 Georgetown, DE 19947

**LOG OF EXPLORATION NO. B-1**

Sheet 1 of 1

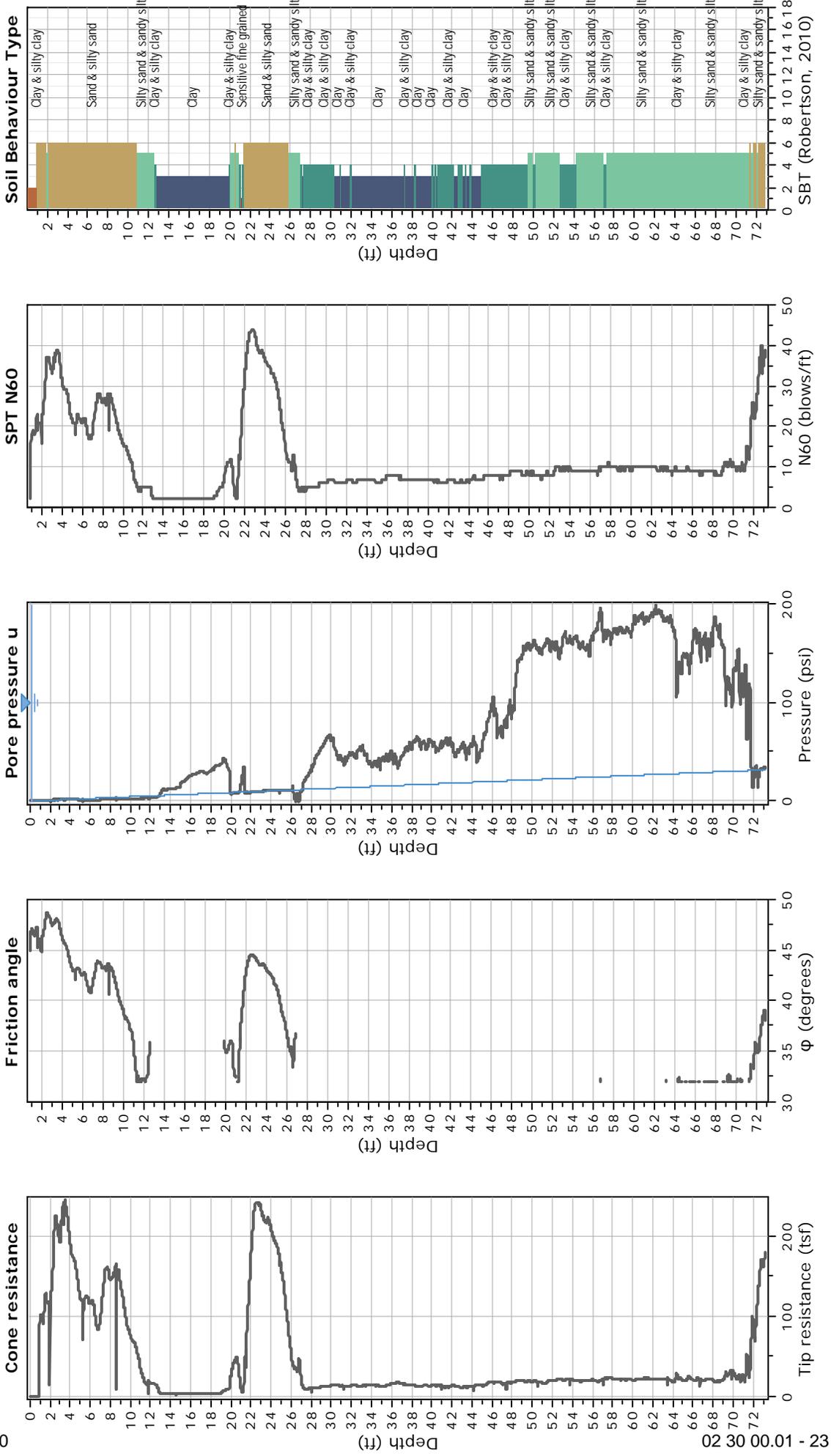


**Geo-Technology Associates, Inc.**  
 21491 Baltimore Avenue  
 Unit 1  
 Georgetown, Delaware 19947

**CPT: CPT-01**

Total depth: 73.20 ft, Date: 9/25/2023  
 Surface Elevation: 3.00 ft  
 Cone Type: DSG1177  
 Cone Operator: D. Hans

**Project: Dewey Beach Town Hall**  
**Location: Dewey Beach, Delaware**



**3 inches of Asphalt**  
 (actual thickness may vary)



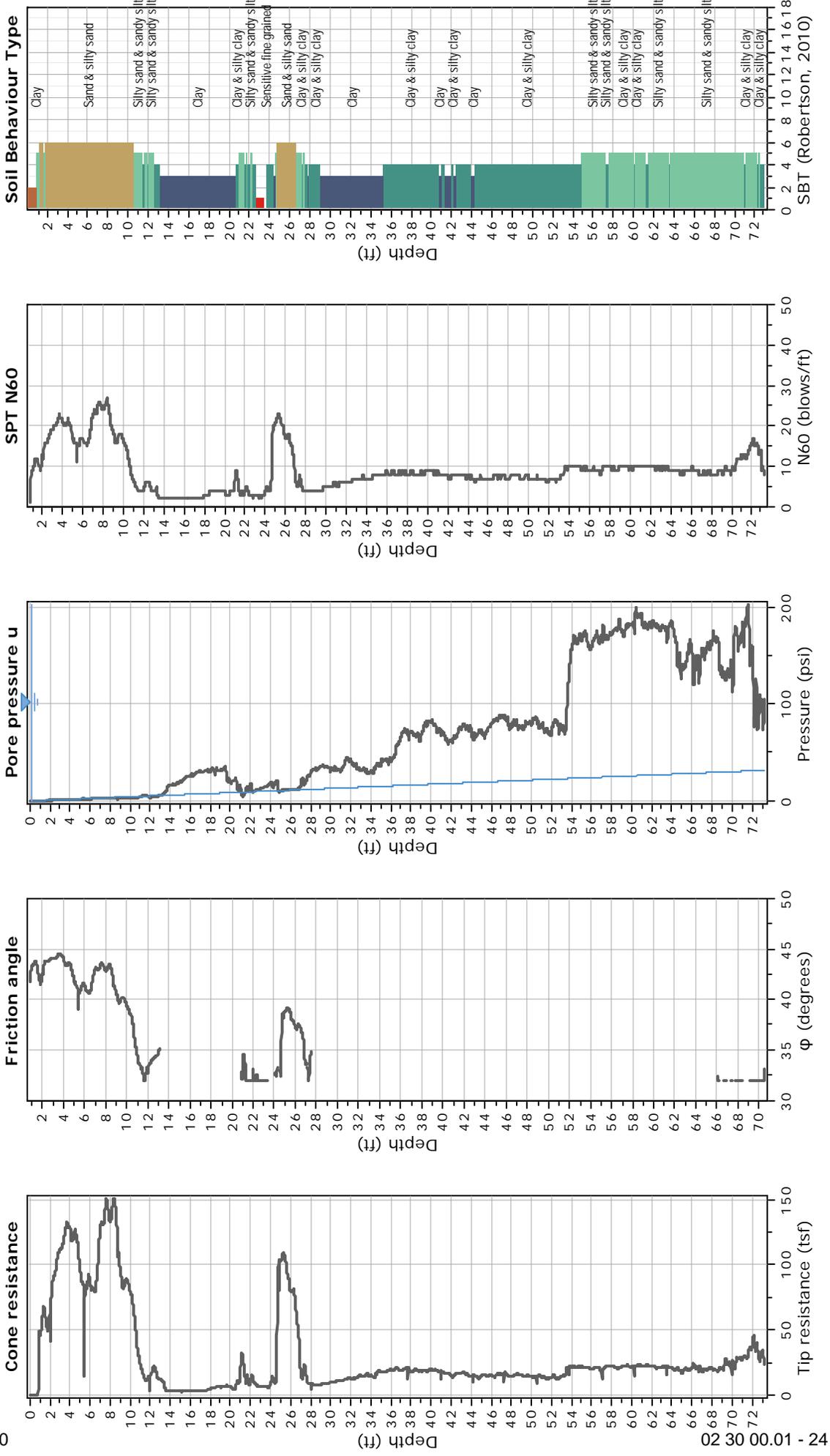
**Geo-Technology Associates, Inc.**  
 21491 Baltimore Avenue  
 Unit 1  
 Georgetown, Delaware 19947

**CPT: CPT-02**

Total depth: 73.23 ft, Date: 9/19/2023  
 Surface Elevation: 3.00 ft  
 Cone Type: DSG1177  
 Cone Operator: D. Hans

**Project: Dewey Beach Town Hall**  
**Location: Dewey Beach, Delaware**

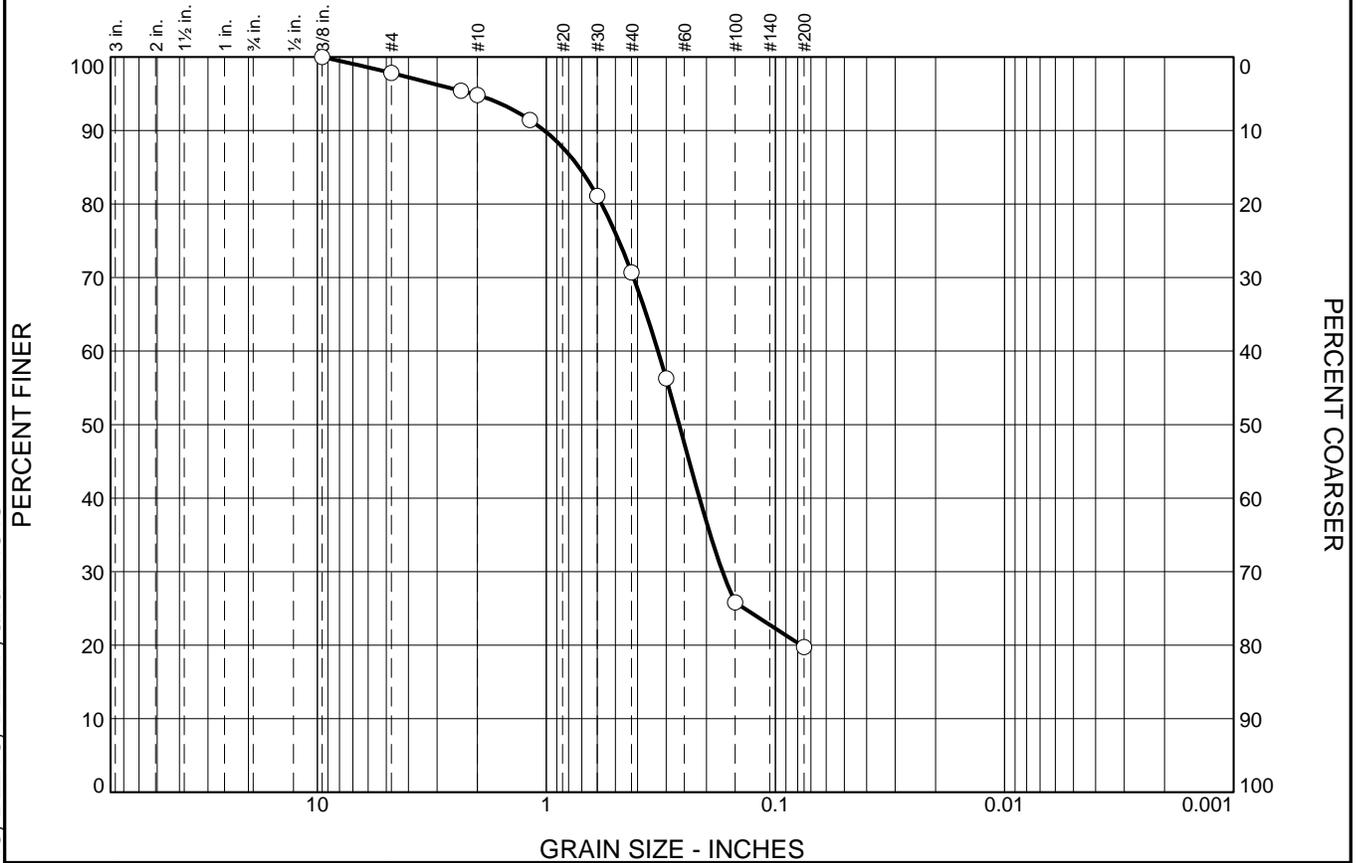
220242.A0



**2 inches of Asphalt**  
 (actual thickness may vary)

**APPENDIX C**  
**LABORATORY DATA**

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	2.2	3.0	24.1	51.0	19.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in	100.0		
#4	97.8		
#8	95.4		
#10	94.8		
#16	91.4		
#30	81.1		
#40	70.7		
#50	56.3		
#100	25.8		
#200	19.7		

**Soil Description**

Dark brown, Silty SAND

**Atterberg Limits**

PL= NP    LL= NP    PI= NP    NM= 13.7

**Coefficients**

D<sub>90</sub>= 1.0202    D<sub>85</sub>= 0.7199    D<sub>60</sub>= 0.3255  
D<sub>50</sub>= 0.2633    D<sub>30</sub>= 0.1703    D<sub>15</sub>=  
D<sub>10</sub>=            C<sub>u</sub>=            C<sub>c</sub>=

**Classification**

USCS= SM                      AASHTO= A-2-4(0)

**Remarks**

\* (no specification provided)

**Source of Sample:** B-1      **Depth:** 1.0-4.0 feet  
**Sample Number:** S-09142023-01

**Date:** 9/14/2023



**GEO-TECHNOLOGY ASSOCIATES, INC.**  
21133 Sterling Avenue, Suite 7  
Georgetown, DE 19947

**Client:** George, Miles & Burh, LLC  
**Project:** Dewey Beach Town Hall

**Project No:** 31231674

**Figure**

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

## **DIVISION 2 – SITEWORK**

### **SECTION 02 41 00**

#### **DEMOLITION**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Demolition and removal of construction as required to allow new construction operations to proceed smoothly and as indicated or specified. Demolition of systems must occur in a manner that allows Owner's operations to continue during construction. The contractor shall demolish, remove, and or dispose of all items necessary for the accomplishment of the project.

B. Comply with applicable codes and accident and fire prevention regulations.

###### **1.02 DUST CONTROL**

A. Take appropriate action to check the spread of dust and to avoid the creation of a nuisance in the surrounding area.

###### **1.03 PROTECTION**

A. Buildings: Protect existing work that is to remain in place. Repair items damaged during performance of the work or replace with new.

B. Personnel Safety: Perform work in a safe manner in order to avoid accidents and property damage. Workmen must be experienced in this type of work. Equipment should be of suitable type, in good working condition, and operated by skilled operators.

C. Traffic: Where pedestrian and driver safety are endangered in the area of removal work, use traffic barricades with flashing lights. Provide alternate routes around closed or obstructed traffic ways.

D. Explosives: Not permitted.

E. Strictly observe regulations when removing tanks and piping which may have contained flammable liquids or gases.

F. Prevent access of unauthorized persons.

## **PART 2 - EXECUTION**

### **2.01 EXISTING FACILITIES TO BE REMOVED**

A. Contractor shall remove any item discovered during the course of demolition. Contractor is responsible for properly disconnecting and capping utilities to the required utility standard. All excavations or holes to be filled and properly compacted with suitable material from the site or imported fill.

B. Utilities and Related Equipment

1. Prevent damage to overhead and underground power cables, telephone, and water and sewer lines during demolition operation.
2. Arrange with utility companies for disconnection of services before starting work.

C. Paving and Slabs: Remove concrete or asphalt concrete paving and slabs including base where indicated.

D. Utility removal, relocation, etc., shall be sequenced such that utility service to existing building shall not be interrupted.

### **2.02 ITEMS TO BE SALVAGED AND TURNED OVER TO OWNER**

A. Items specifically claimed by Owner. Contractor and Owner's representative shall conduct walk through of building prior to commencement of work.

### **2.03 DISPOSITION OF MATERIAL**

A. Title to Materials: Title to materials and equipment to be removed, except as specified otherwise, is vested in the Contractor upon receipt of notice to proceed. The Owner will not be responsible for the condition or loss of or damage to such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

### **2.04 CLEANUP**

A. Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean up spillage from streets and adjacent areas.

B. Dispose of debris and rubbish in an approved off site disposal area.

C. Regulations: Comply with Federal, State, and local hauling and disposal regulations.

**PART 3 – EXECUTION**

Not used.

**END OF SECTION**

## **DIVISION 3- CONCRETE**

### **SECTION 03 10 00**

#### **CONCRETE FORMWORK**

##### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

A. The work under this section includes job fabricated forms, form liners, coatings, ties, accessories and removal of forms.

B. Related Work Specified Elsewhere:

1. Section 03 20 00: Concrete Reinforcement
2. Section 03 30 00: Cast-In-Place Concrete

##### **1.02 QUALITY ASSURANCE**

A. Design Criteria:

1. It is the Contractor's responsibility for design, engineering and construction of formwork.
2. Design formwork in accordance with American Concrete Institute's Recommended Practice for Concrete Formwork ACI 347.
3. Design forms to repeat regularly on regularly repeating structural units or bays. Submit shop drawing covering such forming condition.

B. Allowable Tolerances: Set and maintain concrete forms within tolerance limits stated in American Concrete Institute's Recommended Practice for Concrete Formwork ACI 347.

C. Referenced Standards:

1. American Concrete Institute:
  - a. ACI 347, Recommended Practice for Concrete Formwork.
  - b. ACI 350, Code Requirements for Environmental Engineering Concrete Structures and Commentary.
2. American Plywood Association: APA Grade-Trademarks.
3. U.S. Department of Commerce Product Standards: PS-1 for Construction and Industrial Plywood.

### **1.03 JOB CONDITIONS**

#### **A. Protection:**

1. Protect formwork materials before, during and after erection to insure acceptable finished concrete work. Also protect in-place materials and other operations of work in connection with concrete pours.
2. In event of damage to erected forms, make necessary repairs or replacements prior to concrete pours at no expense to the Owner.

## **PART 2 - PRODUCTS**

### **2.01 FORMS**

#### **A. Lumber:**

1. Form framing, sheathing and shoring shall conform to ACI 347.
2. Use lumber free of material defects that would deform the finished concrete product.

#### **B. Plywood:**

1. Form Sheathing and Panels: Not less than 5/8-inch thick Exterior Type B-B Plywood Class I and II EXT-APA conforming to U.S. Product Standard PS-1. Plywood forms with metal edges will be acceptable.
2. Use Type II only on surfaces not exposed to view.
3. Provide moldings for chamfers (if any) both milled and planed smooth.

#### **C. Steel: Metal Forms of pre-engineered design may be used in lieu of wood forms.**

### **2.02 FORM TIES AND ACCESSORIES**

#### **A. Form Ties:**

1. Provide factory fabricated, adjustable-length, removable or snap-off metal form ties conforming to ACI 347 and ACI 350;
2. Use ties in construction of liquid retaining structures that are designed to prevent seepage or flow of water along the embedded item.
3. Use snap-off metal ties with ends that break at least 1½ inch from the face of the wall. Assembly should provide cone shaped depressions in the forms at the surface at least 1 inch in diameter and 1½ inch deep to allow filling and patching.
4. Removable ties that leave holes larger than 1 inch are not permitted.

5. Form ties fabricated on the project site and wire ties or flat bands are not acceptable.
6. Wood spacers are not permitted within the pour.

**B. Metal Accessories:**

1. Include spacers, chairs, ties or other devices for properly assembling, placing, spacing, and supporting the reinforcement in place.
2. Provide metal accessories with solid plastic feet for exposed slabs and similarly exposed concrete surfaces, both interior and exterior, where accessories come in contact with forms.
3. Aluminum metal accessories that come in contact or are embedded in concrete shall be prohibited.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Prior to placement of concrete, inspect forms for cleanliness and accuracy of alignment.

### **3.02 PREPARATION**

- A. Apply form coatings in accordance with manufacturer's specifications.
- B. Do not allow excess form coating material to accumulate in the forms.
- C. Do not allow form coatings to come in contact with construction joints or reinforcing steel.
- D. Caulk and tape butt joints in formwork.

### **3.03 ERECTION**

- A. Construct forms in accordance with ACI 347 to required dimensions, plumb, straight and mortar tight, and paste tight where appearance is important. Securely brace and shore forms to prevent displacement and to safely support imposed concrete load.
- B. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent the loss of concrete mortar. Locate temporary openings on forms in as inconspicuous a location as possible.

C. Provide openings in concrete formwork of the correct size and in the proper location to accommodate other operations of construction work in the project. Accurately place and securely support items to be built into forms.

D. Wet forms sufficiently to prevent joints in wood forms from opening prior to concrete pour.

### **3.04 FORM REMOVAL (ACI 347)**

A. After concrete has been placed, forms, bracing and supports shall remain undisturbed long enough to allow the concrete to reach the strength necessary to support with safety its own weight plus any live load and earth pressure that might be placed upon it without causing excessive settlement or deflection or any temporary or permanent damage to the structure.

B. Where in his opinion, the leaving in place of forms contributes to the permanent benefit of the structure, the Engineer may order the forms to remain for a longer period than that considered to be sufficient time in the judgment of the Contractor.

C. However, should the Engineer acquiesce in the removal of forms by the Contractor, the Engineer assumes no responsibility as a result of their removal.

D. The Contractor is fully and personally responsible and is in no manner relieved of this responsibility for such removal.

E. Take special care to prevent the breaking of edges and corners of concrete in the stripping of forms.

F. Hammer-pack holes left by tie rods with stiff mortar of the same materials as, but somewhat leaner than, that in the concrete. Render the patch inconspicuous.

**END OF SECTION**

**DIVISION 3 - CONCRETE**  
**SECTION 03 20 00**  
**CONCRETE REINFORCEMENT**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Fabrication and placement of concrete reinforcing materials.

**1.02 REFERENCES**

- A. ASTM A82: Specification for Steel Wire, Plain for Concrete Reinforcement.
- B. ASTM A185: Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- C. ASTM A615: Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement.
- D. CRSI: Manual of Standard Practice.

**1.03 SUBMITTALS**

- A. Shop Drawings.
1. Submit drawings showing layout and details of reinforcing.
  2. Use figured dimensions only, scaling drawings not permitted.
  3. Review of shop drawings is limited to design intent only. No responsibility for a detailed check of member length, size, spacing, or similar detail information is assumed by virtue of such review.
- B. Affidavit.
1. Furnish an affidavit, in duplicate, from the steel manufacturer that steel manufactured for this project meets the requirements of these specifications.

**1.04 DELIVERY, HANDLING AND STORAGE**

- A. Deliver materials bundled, tagged, and marked.

- B. Store at the site to prevent damage and accumulation of dirt or excessive rust.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Deformed Reinforcing Bars: New billet steel, ASTM A615, Grade 60. Stirrups and ties shall be Grade 60.
- B. Welded Wire Fabric Reinforcing: ASTM A185.
- C. Metal Accessories: Include spacers, chairs, ties, or other devices for properly assembling, placing, spacing and supporting reinforcement in place. Provide metal accessories for exposed slabs and similarly exposed concrete surfaces, both interior and exterior, with solid plastic feet where accessories come in contact with forms. Provide chairs for reinforcing for slabs and beams on earth with metal pads attached to the feet to prevent penetration of the earth form.
- D. Tie Wire: Steel ASTM A82.

### **2.02 FABRICATION**

- A. Fabricate to conform to required shapes and dimensions. Comply with CRSI "Manual of Standard Practice".

## **PART 3 - EXECUTION**

### **3.01 PLACING**

- A. Place reinforcement accurately in strict accord with plans and CRSI Manual for Placing Reinforcing Bars.
- B. Support and tie in a way which will prevent displacement while concrete is being placed.
- C. Note requirements for earth forms and exposed concrete.
- D. Remove loose rust and mill scale, earth and other materials which reduce or destroy bond with concrete.
- E. Install wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with 16 gauge wire.

**END OF SECTION**

---

## **DIVISION 3 - CONCRETE**

### **SECTION 03 30 00**

#### **CAST-IN-PLACE CONCRETE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Materials, mixing, placing, testing, curing, and finishing of plain and reinforced cast in place concrete.
- B. Use air-entraining admixture for all concrete subject to freeze/thaw, unless otherwise shown or specified.

###### **1.02 REFERENCES**

- A. ASTM C31: Method of Making and Curing Concrete Test Specimens in the Field.
  - B. ASTM C33: Concrete Aggregates.
  - C. ASTM C39: Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - D. ASTM C150: Portland Cement.
  - E. ASTM C260: Air-Entraining Admixtures for Concrete.
  - F. ASTM C494: Chemical Admixtures for Concrete.
  - G. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
  - H. FS HH-F-341: Fillers, Expansion Joint; Bituminous (Asphalt and Tar) and Non-bituminous.
  - I. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings
  - J. FEMA Technical Bulletin 5: Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas
  - K. FEMA Technical Bulletin 10: Ensuring That Structures Built on Fill In or Near
-

## Special Flood Hazard Areas Are Reasonably Safe from Flooding

### L. ASCE 24: Flood Resistant Design and Construction

#### 1.03 SUBMITTALS

A. List of materials and manufacturers for review.

B. Design Mixes: Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Submit a complete list of materials including type; brand; source and amount of cement, fly ash, pozzolans, silica fume, ground slag polypropylene fibers, and admixtures; and applicable reference specifications. Provide mix proportion data using at least three different water-cement ratios for each type of mixture, which produce a range of strength encompassing those required for each class and type of concrete required. If source material changes, resubmit mix proportion data using revised source material. Provide only materials that have been proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Engineer. Indicate clearly in the submittal where each mix design is used when more than one mix design is submitted. Submit additional data regarding concrete aggregates if the source of aggregate changes. Submit copies of the fly ash, silica fume and pozzolan test results, in addition. The approval of fly ash, silica fume and pozzolan test results must be within 6 months of submittal date. Obtain acknowledgement of receipt prior to concrete placement.

#### 1.04 QUALITY ASSURANCE

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

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

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

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01, or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician

– Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician – Grade II.

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

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

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

## **1.05 RELATED SECTIONS**

A. Section 03 45 43 - Polished Concrete System

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. Cement: ASTM C 150, Type 1. Use only one brand throughout the project.

B. Aggregates.

1. Coarse aggregate: ASTM C 33. Free of loam, clay, or foreign matter. Crushed stone or gravel, hard, durable and free of adherent coatings. Maximum size number 57 unless noted otherwise. Maximum size for toppings, slabs, and fills 3 inches and less in thickness is 3/8 inch.
2. Fine Aggregate: Natural sand free of loam, clay or foreign matter.

C. Admixtures: Use only one brand throughout the project. Named or approved substitute.

1. Accelerator may be used only if design mixes utilizing the accelerator are submitted and accepted.
2. Do not use admixtures containing calcium chloride.

D. Water: ASTM C94 and potable.

E. Expansion Joint Filler: FS HH-F-341, Type 1, pre-molded bituminous impregnated fiberboard strips.

F. Plastic Vapor Retarder: Polyethylene sheet, ASTM E1745 Class A, not less than 10 mils thick.

1. Available Manufacturers:
  - a. Fortifiber Corporation
  - b. Raven Industries, Inc.
  - c. Reef Industries, Inc.
  - d. Stego Industries, LLC
  - b. Approved Substitution

G. Concrete Curing Materials

1. Absorptive Cover: Provide burlap, cotton mats, and other absorbent materials for curing concrete, as described in ACI 308R.
2. Moisture-Retaining Cover: Provide waterproof paper cover for curing concrete conforming to ASTM C171, regular or white, or polyethylene sheeting conforming to ASTM C171, or polyethylene-coated burlap consisting of a laminate of burlap and a white opaque polyethylene film permanently bonded to the burlap; burlap must conform to ASTM C171, Class 3, and polyethylene film must conform to ASTM C171. When tested for water retention in accordance with ASTM C156, weight of water lost 72 hours after application of moisture retaining covering material must not exceed 0.039 gram per square centimeter of the mortar specimen surface.
3. Membrane-Forming Curing Compound: Provide liquid type compound conforming to ASTM C309, Type 1, clear, Type 1D with fugitive dye for interior work and Type 2, white, pigmented for exterior work.

H. Biodegradable Form Release Agent: Provide form release agent that is colorless, biodegradable, and rapeseed oil-based, soy oil-based or water-based, with a zero VOC content. A minimum of 85 percent of the total product must be biobased material. Provide product that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces. Provide form release agent that does not contain diesel fuel, petroleum-based lubricating oils, waxes, or kerosene.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION FOR PLACEMENT OF CONCRETE**

A. Formwork. Also see Section 03 11 00 Concrete Forming.

1. Ascertain that work under other Divisions, which passes through and/or is set in the concrete, such as sleeves, anchors, inserts and conduits, has been set in place. Notify other trades in ample time for them to install any

- portion of their work.
2. Remove water, hardened concrete, debris, ice, and other foreign materials from forms (earth or fabricated).
  3. Sprinkle formwork with water just prior to placement of concrete.
- B. Embedded Items: Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
- C. Reinforcing: Inspect before placing concrete.
- D. Runways: Provide as required so that equipment used to deposit concrete is not wheeled over reinforcement.
- E. Bonding: Before depositing new concrete on or against concrete which has already set, thoroughly roughen existing surfaces and clean of laitance, foreign matter and loose particles. Retighten forms and thoroughly wet existing surfaces.
- F. Equipment: At no time during the mixing, placing or curing of concrete let aluminum equipment come in contact with fresh concrete.
- G. Construction Joints: Dowel and key and locate as to least impair the strength of the structure. Location shall be approved. Where construction joints occur in reinforced concrete, joints shall follow a plane perpendicular to principal reinforcement with a bulkhead shaped to produce a keyed surface.
- H. Plastic Vapor Retarders: Place, protect and repair vapor retarders according to ASTM E1643 and manufacturer's written instructions. Lap joints 6 inches and seal with manufacturer's recommended tape.
- I. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.

### **3.02 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE ASTM C94/C94M, and ACI/MCP-2, except as modified herein.**

- A. Batching equipment must be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.
1. Measuring: Make measurements at intervals as specified in paragraphs entitled "Sampling" and "Testing."
  2. Mixing: ASTM C94/C94M and ACI/MCP-2. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the

aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 84 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 84 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Do not add water to concrete during delivery, at project site, or during placement.

3. Transporting: Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

### **3.03 PLACING CONCRETE**

A. Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other. Position grade stakes on 10 foot centers maximum in each direction when pouring interior slabs and on 20 foot centers maximum for exterior slabs.

1. General Placing Requirements: Deposit concrete continuously or in layers of such thickness that no concrete is placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints as specified. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic. Deposit concrete as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete to receive other construction must be screeded to proper level to avoid excessive skimming or grouting. Do not use concrete which becomes nonplastic and unworkable or does not meet quality control limits as specified or has been contaminated by foreign materials. Use of retempered concrete is permitted. Remove rejected concrete from the site.
2. Footing Placement: Concrete for footings may be placed in excavations without forms upon inspection and approval by the Inspector. Excavation width must be a minimum of 4 inches greater than indicated.
3. Vibration: ACI/MCP-2. Furnish a spare, working, vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4

inches in depth with high frequency mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate internal vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 impulses per minute when submerged. Do not use vibrators to transport the concrete in the forms. Penetrate the previously placed lift with the vibrator when more than one lift is required. Use external vibrators on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete.

4. Pumping: ACI/MCP-2. Pumping must not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment must not exceed 2 inches. Do not convey concrete through pipe made of aluminum or aluminum alloy. Avoid rapid changes in pipe sizes. Limit maximum size of coarse aggregate to 33 percent of the diameter of the pipe. Limit maximum size of well rounded aggregate to 40 percent of the pipe diameter. Take samples for testing at both the point of delivery to the pump and at the discharge end.
5. Cold Weather: ACI/MCP-2. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to 37 degrees F in any 1 hour and 50 degrees F per 24 hours after heat application.
6. Hot Weather: Maintain required concrete temperature using Figure 2.1.5 in ACI/MCP-2 to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.
7. Follow-up: Check concrete within 24 hours of placement for flatness, levelness, and other specified tolerances. Adjust formwork and placement techniques on subsequent pours to achieve specified tolerances.

8. **Placing Concrete in Forms:** Deposit concrete placed in forms in horizontal layers not exceeding 24 inches. Remove temporary spreaders in forms when concrete placing has reached elevation of spreaders. Consolidate concrete placed in forms by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Provide vibrating equipment adequate in number of units and power of each unit to properly consolidate concrete. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced points not farther apart than visible effectiveness of machine. Do not insert vibrator into lower courses of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of concrete mix. Do not start placing of concrete in supporting elements until concrete previously placed in columns and walls is no longer plastic and has been in place a minimum of 2 hours.
9. **Placing Concrete Slabs:** Place and consolidate concrete for slabs in a continuous operation, within the limits of approved construction joints until placing of panel or section is completed. During concrete placing operations, consolidate concrete by mechanical vibrating equipment so that concrete is worked around reinforcement and other embedded items and into corners. Consolidate concrete placed in beams and girders of supported slabs and against bulkheads of slabs on ground by mechanical vibrators as specified. Consolidate concrete in remainder of slabs by vibrating bridge screeds, roller pipe screeds, or other approved method. Limit consolidation operations to time necessary to obtain consolidation of concrete without bringing an excess of fine aggregate to the surface. Concrete to be consolidated must be as dry as practical and surfaces thereof must not be manipulated prior to finishing operations. Bring concrete correct level with a straightedge and struck-off. Use bull floats or darbies to smooth surface, leaving it free of humps or hollows. Sprinkling of water on plastic surface is not permitted. Provide finish of slabs as specified.
10. **Bonding:** Surfaces of set concrete at joints, except where bonding is obtained by use of concrete bonding agent, must be roughened and cleaned of laitance, coatings, loose particles, and foreign matter. Roughen surfaces in a manner that exposes the aggregate uniformly and does not leave laitance, loosened particles of aggregate, nor damaged concrete at the surface. Obtain bonding of fresh concrete that has set as follows: At joints between footings and walls or columns, between walls or columns and the beams or slabs they support, and elsewhere unless otherwise specified; roughened and cleaned surface of set concrete must be dampened, but not saturated, immediately prior to placing of fresh concrete. At joints in exposed-to-view work; at vertical joints in walls; at joints near midpoint of span in girders, beams, supported slabs, other structural members; in work designed to contain liquids; the roughened

and cleaned surface of set concrete must be dampened but not saturated and covered with a cement grout coating. Provide cement grout that consists of equal parts of Portland cement and fine aggregate by weight with not more than 6 gallons of water per sack of cement. Apply cement grout with a stiff broom or brush to a minimum thickness of 1/16 inch. Deposit fresh concrete before cement grout has attained its initial set. Bonding of fresh concrete to concrete that has set may be obtained by use of a concrete bonding agent. Apply such bonding material to cleaned concrete surface in accordance with approved printed instructions of bonding material manufacturer.

### **3.04 SURFACE FINISHES EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES**

A. Defects: Repair formed surfaces by removing minor honeycombs, pits greater than 1 square inch surface area or 0.25 inch maximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval of corrective action prior to repair. The surface of the concrete must not vary more than the allowable tolerances of ACI/MCP-4. Exposed surfaces must be uniform in appearance and finished to a smooth form finish unless otherwise specified.

B. Not Against Forms (Top of Walls): Surfaces not otherwise specified must be finished with wood floats to even surfaces. Finish must match adjacent finishes.

C. Formed Surfaces

1. Tolerances: ACI/MCP-1 and as indicated.
2. As-Cast Rough Form: Provide for surfaces not exposed to public view. Patch these holes and defects and level abrupt irregularities. Remove or rub off fins and other projections exceeding 0.25 inch in height.
3. Standard Smooth Finish: Finish must be as-cast concrete surface as obtained with form facing material for standard smooth finish. Repair and patch defective areas as specified; and all fins and remove other projections on surface.
4. Grout Finish: Provide finish that is standard, smooth coated with grout as specified. Give finish to interior and exterior concrete vertical surfaces that are to be exposed to view. Grout is required consisting of one part portland cement to 1-1/2 parts fine aggregate by volume, mixed with water to produce a consistency of thick paint. Portland cement portion must be a blend of standard Portland cement and white portland cement, proportioned as determined by trial mixes so that final color of grout when dry approximates color of surrounding concrete. Fine aggregate must pass No. 30 mesh sieve. Surface of concrete is required to be wetted,

and grout must be applied immediately to wetted surfaces. Spread grout over surface with clean burlap pads or sponge-rubber floats to fill pits, air bubbles, and surface holes. Remove excess grout by scraping, then rubbing surface with clean burlap to remove visible grout film. Keep grout damp by means of fog spray during setting period. Complete finish the day it is started, and make limits of a finished area at natural breaks in finished surface.

### **3.05 FLOOR, SLAB, AND PAVEMENT FINISHES AND MISCELLANEOUS CONSTRUCTION**

A. ACI/MCP-2, unless otherwise specified. Slope floors uniformly to drains where drains are provided. Where straightedge measurements are specified, Contractor must provide straightedge.

1. Finish: Place, consolidate, and immediately strike off concrete to obtain proper contour, grade, and elevation before bleedwater appears. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment. If bleedwater is present prior to floating the surface, drag the excess water off or remove by absorption with porous materials. Do not use dry cement to absorb bleedwater.
  - a. Scratched: Use for surfaces intended to receive bonded applied cementitious applications. After the concrete has been placed, consolidated, struck off, and leveled to a Class C tolerance as defined below, roughen the surface with stiff brushes or rakes before final set.
  - b. Floated: Use for exterior slabs where not otherwise specified. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further, until ready for floating. Whether floating with a wood, magnesium, or composite hand float, with a bladed power trowel equipped with float shoes, or with a powered disc, float must begin when the surface has stiffened sufficiently to permit the operation. During or after the first floating, check surface with a 10 foot straightedge applied at no less than two different angles, one of which is perpendicular to the direction of strike off. Cut down high spots and fill low spots during this procedure to produce a surface level within 1/4 inch in 10 feet.
  - c. Concrete Containing Silica Fume: Finish using magnesium floats or darbies.
  - d. Steel Troweled: Use for floors intended as walking surfaces, and for reception of floor coverings. First, provide a floated finish. Next, the finish must be power troweled two times, and finally hand troweled. The first troweling after floating needs to produce a smooth surface which is relatively free of defects but which may still show some trowel marks. Perform additional trowelings done by hand after the surface has hardened sufficiently. The final troweling

is done when a ringing sound is produced as the trowel is moved over the surface. Thoroughly consolidate the surface by the hand troweling operations. The finished surface must be essentially free of trowel marks and uniform in texture and appearance. The finished surface must produce a surface level to within 1/4 inch in 10 feet. On surfaces intended to support floor coverings, remove any defects of sufficient magnitude to show through the floor covering by grinding.

- e. Broomed: Use on exterior walks, platforms, patios, and ramps, unless otherwise indicated. Perform a floated finish, then draw a broom or burlap belt across the surface to produce a coarse scored texture. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.
  - f. Pavement: Screed the concrete with a template advanced with a combined longitudinal and crosswise motion. Maintain a slight surplus of concrete ahead of the template. After screeding, float the concrete longitudinally. Use a straightedge to check slope and flatness; correct and refloat as necessary. Obtain final finish by belting. Lay belt flat on the concrete surface and advance with a sawing motion; continue until a uniform but gritty nonslip surface is obtained. Round edges and joints with an edger having a radius of 1/8 inch.
  - g. Chemical-Hardener Treatment: Apply liquid-chemical floor hardener where indicated after curing and drying concrete surface. Dilute liquid hardener with water and apply in three coats. First coat must be one-third strength, second coat one-half strength, and third coat two-thirds strength. Apply each coat evenly and allow to dry 24 hours between coats. Approved proprietary chemical hardeners must be applied in accordance with manufacturer's printed directions.
2. Flat Floor Finishes: ACI/MCP-2. Construct in accordance with one of the methods recommended in Table 7.15.3, "Typical Composite Ff/FL Values for Various Construction Methods." ACI/MCP-1 for tolerance tested by ASTM E1155.
- Specified Conventional Value:
    - Floor Flatness (Ff) 40
    - Floor Levelness (FL) 30
  - a. Measurement of Floor Tolerances: Test slab within 24 hours of the final troweling. Provide tests to Contracting Officer within 12 hours after collecting the data. Floor flatness inspector is required to provide a tolerance report which must include:
    - Key plan showing location of data collected.
    - Results required by ASTM E1155.
  - b. Remedies for Out of Tolerance Work: Contractor is required to repair and retest any floors not meeting specified tolerances. Prior

to repair, Contractor must submit and receive approval for the proposed repair, including product data from any materials proposed. Repairs must not result in damage to structural integrity of the floor. For floors exposed to public view, repairs must prevent any uneven or unusual coloring of the surface.

### **3.06 CONCRETE SLABS ON GRADE**

- A. Place concrete slabs on earth over drainage fill on a compacted sub-grade in accordance with the Geotechnical report. Provide vapor retarder and expansion joint material where indicated.
- B. Place construction joints under walls and partitions where feasible.
- C. Review with Engineer location of joints and sequence of pouring slabs prior to first slab pour.

### **3.07 CURING AND PROTECTION**

A. ACI/MCP-2 unless otherwise specified. Begin curing immediately following form removal. Avoid damage to concrete from vibration created by blasting, pile driving, movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, and any other activity resulting in ground vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. Do not use membrane-forming compound on surfaces where appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period. Provide moist curing for those areas receiving liquid chemical sealer-hardener or epoxy coating. Allow curing compound/sealer installations to cure prior to the installation of materials that adsorb VOCs, including ceiling tiles and gypsum wall board .

- 1. General: Protect freshly placed concrete from premature drying and cold or hot temperature and maintain without drying at a relatively constant temperature for the period of time necessary for hydration of cement and proper hardening of concrete. Start initial curing as soon as free water has disappeared from surface of concrete after placing and finishing. Keep concrete moist for minimum 72 hours. Final curing must immediately follow initial curing and before concrete has dried. Continue final curing until cumulative number of hours or fraction thereof (not necessarily consecutive) during which temperature of air in contact with the concrete is above 50 degrees F has totaled 168 hours. Alternatively, if tests are made of cylinders kept adjacent to the structure and cured by the same methods, final curing may be terminated when the average compressive

- strength has reached 70 percent of the 28-day design compressive strength. Prevent rapid drying at end of final curing period.
2. Moist Curing: Remove water without erosion or damage to the structure. Prevent water run-off.
    - a. Ponding or Immersion: Continually immerse the concrete throughout the curing period. Water must not be more than 50 degrees F less than the temperature of the concrete. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.
    - b. Fog Spraying or Sprinkling: Apply water uniformly and continuously throughout the curing period. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.
    - c. Pervious Sheeting: Completely cover surface and edges of the concrete with two thicknesses of wet sheeting. Overlap sheeting 6 inches over adjacent sheeting. Provide sheeting that is at least as long as the width of the surface to be cured. During application, do not drag the sheeting over the finished concrete nor over sheeting already placed. Wet sheeting thoroughly and keep continuously wet throughout the curing period.
    - d. Impervious Sheeting: Wet the entire exposed surface of the concrete thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting. Cover or wrap columns, walls, and other vertical structural elements from the top down with impervious sheeting; overlap and continuously tape sheeting joints; and introduce sufficient water to soak the entire surface prior to completely enclosing.
  3. Liquid Membrane-Forming Curing Compound: Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Apply in accordance with the recommendations of the manufacturer immediately after any water sheen which may develop after finishing has disappeared from the concrete surface. Provide and maintain compound on the concrete surface throughout the curing period. Do not use this method of curing where the use of Figure 2.1.5 in ACI/MCP-2 indicates that hot weather conditions cause an evaporation rate exceeding 0.2 pound of water per square foot per hour.
    - a. Application: Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance, and before joints are sawed. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of

- compound in a continuous operation. The total coverage for the two coats must be 200 square feet maximum per gallon of undiluted compound unless otherwise recommended by the manufacturer's written instructions. The compound must form a uniform, continuous, coherent film that does not check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Re-spray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.
- b. Protection of Treated Surfaces: Prohibit pedestrian and vehicular traffic and other sources of abrasion at least 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.
4. Liquid Chemical Sealer-Hardener: Apply sealer-hardener to interior floors not receiving floor covering and floors located under access flooring. Apply the sealer-hardener in accordance with manufacturer's recommendations. Seal or cover joints and openings in which joint sealant is to be applied as required by the joint sealant manufacturer. Do not apply the sealer hardener until the concrete has been moist cured and has aged for a minimum of 30 days. Apply a minimum of two coats of sealer-hardener.
  5. Requirements for Type III, High-Early-Strength Portland Cement: The curing periods are required to be not less than one-fourth of those specified for portland cement, but in no case less than 72 hours.
  6. Curing Periods: ACI/MCP-2 except 10 days for retaining walls, pavement or chimneys, 21 days for concrete that is in full-time or intermittent contact with seawater, salt spray, alkali soil or waters. Begin curing immediately after placement. Protect concrete from premature drying, excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing are subject to approval by the Engineer.
  7. Curing Methods: Accomplish curing by moist curing, by moisture-retaining cover curing, by membrane curing, and by combinations thereof, as specified.
    - a. Moist curing: Accomplish moisture curing by any of the following methods: Keeping surface of concrete wet by covering with water Continuous water spraying Covering concrete surface with specified absorptive cover for curing concrete saturated with water and keeping absorptive cover wet by water spraying or intermittent hosing. Place absorptive cover to provide coverage of concrete surfaces and edges with a slight overlap over adjacent absorptive covers.
    - b. Moisture-cover curing: Accomplish moisture-retaining cover curing by covering concrete surfaces with specified moisture-retaining cover for curing concrete. Place cover directly on concrete in widest practical width, with sides and ends lapped at least 3 inches. Weight cover to prevent displacement; immediately repair tears or

- holes appearing during curing period by patching with pressure-sensitive, waterproof tape or other approved method.
- c. Membrane curing: Accomplish membrane curing by applying specified membrane-forming curing compound to damp concrete surfaces as soon as moisture film has disappeared. Apply curing compound uniformly in a two-coat operation by power-spraying equipment using a spray nozzle equipped with a wind guard. Apply second coat in a direction at right angles to direction of first coat. Total coverage for two coats must be not more than 200 square feet per gallon of curing compound. Respray concrete surfaces which are subjected to heavy rainfall within 3 hours after curing compound has been applied by method and at rate specified. Maintain continuity of coating for entire curing period and immediately repair damage to coating during this period. Membrane-curing compounds must not be used on surfaces that are to be covered with coating material applied directly to concrete or with a covering material bonded to concrete, such as other concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, painting, and other coatings and finish materials.
  8. Curing Formed Surfaces: Accomplish curing of formed surfaces, including undersurfaces of girders, beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed before end of curing period, accomplish final curing of formed surfaces by any of the curing methods specified above, as applicable.
  9. Curing Unformed Surfaces: Accomplish initial curing of unformed surfaces, such as monolithic slabs, floor topping, and other flat surfaces, by membrane curing. Unless otherwise specified, accomplish final curing of unformed surfaces by any of curing methods specified above, as applicable. Accomplish final curing of concrete surfaces to receive liquid floor hardener of finish flooring by moisture-retaining cover curing.
  10. Temperature of Concrete During Curing: When temperature of atmosphere is 41 degrees F and below, maintain temperature of concrete at not less than 55 degrees F throughout concrete curing period or 45 degrees F when the curing period is measured by maturity. When necessary, make arrangements before start of concrete placing for heating, covering, insulation, or housing as required to maintain specified temperature and moisture conditions for concrete during curing period. When the temperature of atmosphere is 80 degrees F and above or during other climatic conditions which cause too rapid drying of concrete, make arrangements before start of concrete placing for installation of wind breaks, of shading, and for fog spraying, wet sprinkling, or moisture-retaining covering of light color as required to protect concrete during curing period. Changes in temperature of concrete must be uniform and

not exceed 37 degrees F in any 1 hour nor 80 degrees F in any 24-hour period.

11. Protection from Mechanical Injury: During curing period, protect concrete from damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration and from damage caused by rain or running water.
12. Protection After Curing: Protect finished concrete surfaces from damage by construction operations.

### **3.08 FIELD QUALITY CONTROL**

A. Sampling: ASTM C172/C172M. Collect samples of fresh concrete to perform tests specified. ASTM C31/C31M for making test specimens.

B. Testing

1. Slump Tests: ASTM C143/C143M. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete.
2. Temperature Tests: Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.
3. Compressive Strength Tests: ASTM C39/C39M. Make six test cylinders for each set of tests in accordance with ASTM C31/C31M. Take precautions to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, three cylinders at 28 days, and hold one cylinder in reserve. Take samples for strength tests of each mix design of and for concrete placed each day not less than once a day, nor less than once for each 160 cubic yards of concrete, nor less than once for each 5400 square feet of surface area for slabs or walls. For the entire project, take no less than six sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result must be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than  $f'c$  or if any strength test result falls below  $f'c$  by more than 450 psi, take a minimum of three ASTM C42/C42M core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test is considered structurally adequate if the average of three cores is equal to at least 85 percent of  $f'c$  and if no single core is less than 75 percent of  $f'c$ . Retest locations represented by erratic core strengths. Remove concrete not meeting strength criteria and provide new

- acceptable concrete. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.
4. Air Content: ASTM C173/C173M or ASTM C231/C231M for normal weight concrete . Test air-entrained concrete for air content at the same frequency as specified for slump tests.
  5. Strength of Concrete Structure: Compliance with the following is considered deficient if it fails to meet the requirements which control strength of structure in place, including following conditions:
    - a. Failure to meet compressive strength tests as evaluated
    - b. Reinforcement not conforming to requirements specified
    - c. Concrete which differs from required dimensions or location in such a manner as to reduce strength
    - d. Concrete curing and protection of concrete against extremes of temperature during curing, not conforming to requirements specified
    - e. Concrete subjected to damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration
    - f. Poor workmanship likely to result in deficient strength

### **C. Floodproofing Certification**

1. Documentation:
  - a. Provide certification from a registered professional engineer or architect that the concrete work complies with FEMA Technical Bulletin 3 for dry floodproofing measures.
2. Certification Form:
  - a. Use FEMA Form 086-0-34 to document and certify that the cast-in-place concrete construction meets NFIP requirements.

## **3.09 JOINTS**

A. Construction Joints: Make and locate joints not indicated so as not to impair strength and appearance of the structure, as approved. Locate construction joints as follows:

1. In walls at not more than 60 feet in any horizontal direction; at top of footing; at top of slabs on ground; and at underside of deepest beam or girder framing into wall.
2. In columns or piers, at top of footing; at top of slabs on ground; and at underside of deepest beam or girder framing into column or pier.
3. Near midpoint of spans for supported slabs, beams, and girders unless a beam intersects a girder at the center, in which case construction joints in girder must offset a distance equal to twice the width of the beam. Make transfer of shear through construction joint by use of inclined reinforcement.

4. Provide keyways at least 1-1/2-inches deep in construction joints in walls and slabs and between walls and footings; approved bulkheads may be used for slabs. Joints must be perpendicular to main reinforcement. Reinforcement must be continued across construction joints.

B. Isolation Joints in Slabs on Ground: Provide joints at points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, and elsewhere as indicated on plans. Fill joints with premolded joint filler strips 1/2 inch thick, extending full slab depth. Install filler strips at proper level below finish floor elevation with a slightly tapered, dress-and-oiled wood strip temporarily secured to top of filler strip to form a groove not less than 3/4 inch in depth where joint is sealed with sealing compound and not less than 1/4 inch in depth where joint sealing is not required. Remove wood strip after concrete has set. Contractor must clean groove of foreign matter and loose particles after surface has dried.

C. Control Joints in Slabs on Ground (does not include pile supported slabs that span between piles): Provide joints to form panels as indicated. Under and on exact line of each control joint, cut 50 percent of welded wire fabric reinforcement before placing concrete. Joints must be 1/8-inch wide by 1/5 to 1/4 of slab depth and formed by inserting hand-pressed fiberboard strip into fresh concrete until top surface of strip is flush with slab surface or by cutting the concrete with a saw after the concrete has set. After concrete has cured for at least 7 days, the Contractor must remove inserts and clean groove of foreign matter and loose particles. Pile-supported slab are not considered slabs on ground and control joints shall not be placed in these slabs unless specifically shown in the construction documents.

D. Sealing Joints in Slabs on Ground: Isolation and control joints which are to receive finish flooring material must be sealed with joint sealing compound after concrete curing period. Slightly underfill groove with joint sealing compound to prevent extrusion of compound. Remove excess material as soon after sealing as possible. Sealing is not required for isolation and control joints to be covered with finish flooring material. Groove must be left ready to receive filling material that is provided as part of finish floor covering work.

### **3.10 INSTALLATION OF ANCHORAGE DEVICES**

A. General: Anchorage devices and embedded items required for other work that is attached to, or supported by, set and build in cast-in-place concrete as part of the work of this section, using setting drawings, instructions, and directions for work to be attached thereto.

B. Placing Anchorage Devices: Anchorage devices and embedded items must be positioned accurately and supported against displacement. Fill openings in anchorage devices such as slots and threaded holes with an approved, removable material to prevent entry of concrete into openings.

### **3.11 CONCRETE CONVEYING**

A. Transfer of Concrete At Project Site: Handle concrete from point of delivery and transfer to concrete conveying equipment and to locations of final deposit as rapidly as practical by methods which prevent segregation and loss of concrete mix materials.

B. Mechanical Equipment for Conveying Concrete: Equipment must ensure a continuous flow of concrete at delivery end, as approved. Provide runways for wheeled concrete-conveying equipment from concrete delivery point to locations of final deposit. Interior surfaces of concrete conveying equipment must be free of hardened concrete, debris, water, snow, ice, and other deleterious substances.

**END OF SECTION**

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## **DIVISION 3 - CONCRETE**

### **SECTION 03 45 43**

#### **POLISHED CONCRETE SYSTEM**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Polished concrete finish, including sealers and hardeners, for application where indicated on the drawings.

###### **1.02 SUBMITTALS**

A. Product Data: Submit Manufacturer's technical literature for each product indicated, or required by manufacturer for a complete installation. Include manufacturer's technical data, application instructions, and recommendations.

B. Installer Qualifications: Data for company, principal personnel, experience and training. Provide a letter documenting installer's accreditation and certification compliance, as specified under quality assurance.

C. Test Reports: Provide field quality control sheen gloss reading and static coefficient of friction test results conducted as specified and recorded on floor plan diagram confirming compliance with specified performance criteria.

D. Samples: Submit 2 samples 12-inches by 12-inches by 1-inch-thick demonstrating finish system using actual design mix of concrete proposed for finished work. Samples will be reviewed for appearance, color, and texture.

###### **1.04 QUALITY ASSURANCE**

A. Installer Qualifications: Installer should have a minimum of 3 certifiable polished concrete applications comparable to project size exposure within the last 48 months from date of project.

B. Mock-Up: Prior to commencing the work in this section, construct an on-site mock-up of the finish system for each type of color and finish used on project. Install mock-up at location as directed by Architect. Mock-up shall be a representation of specified process, surface, finish, color and joint design/treatments. Install mock-ups using the same installer personnel who will perform work. Approved mock-ups may become part of completed work, if undisturbed at time of substantial completion and if approved by Architect to remain.

1. Mock-Up Size: 100 SF sample panel at jobsite at location as directed under conditions similar to those which will exist during actual placement. Maintain sample panel exposed to view for duration of concrete project installation.
  2. If the Architect or Owner Representative determines that mock-ups do not meet requirements, demolish and remove them from the site and cast others until mock-ups are approved.
- C. Pre-installation Meetings: A pre-installation meeting must be conducted to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. Hardening/Densifying Agent: H&C Endurapolish Clear Liquid Hardener, Densifier & Dustproofer as manufactured for H&C Concrete Products for The Sherwin Williams 101 Prospect Avenue, N.W., 10 Midland Building, Cleveland, Ohio 44115.

1. Performance Criteria:
  - a. Abrasion Resistance: ASTM C779 – Up to 40% increase in abrasion resistance.
  - b. Impact Strength: ASTM C805 – Up to 21% increase impact strength.
  - c. Ultra Violet Light and Water Spray: ASTM G23-81 – No adverse effect to ultra violet and water spray.
  - d. Reflectivity: Up to 30% increase in reflectivity.

B. Sealing Agent: H&C Endurapolish Lithium Protective Finish, manufactured for H&C Concrete Products for The Sherwin Williams 101 Prospect Avenue, N.W., 10 Midland Building, Cleveland, Ohio 44115.

1. Performance Criteria:
  - a. Slip Resistance ASTM D2047 Results: >.6 Static Coefficient of Friction.
  - b. Impact Strength: ASTM C805 – Up to 21% increase impact strength.

C. Color System Agent: H&C Acetone Dye Stains, manufactured for H&C Concrete Products for The Sherwin Williams 101 Prospect Avenue, N.W., 10 Midland Building, Cleveland, Ohio 44115.

1. Color: To be selected from manufacturer's standard range based upon

- samples and mock-up.
2. Limitations: Dye Stains are UV stable but are NOT fade resistant. Some premature fading can occur if applied to surfaces exposed to direct sunlight.

## **PART 3 - EXECUTION**

### **3.01 SURFACE CONDITIONS**

- A. Examine substrate, with installer present, for conditions affecting performance of finish. Correct conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that base slab meets the finish and surface profile requirements specified in Division 3 section "Cast-in-Place Concrete," and as specified herein.
- C. Prior to application, verify that floor surfaces are free of concrete and construction laitance.
- D. Existing concrete shall comply with the following:
  1. Minimum Concrete Compressive Strength: 3000 psi.
  2. Normal Weight Concrete: No lightweight aggregate.
  3. Non-air entrained.
  4. Placement properties: Natural concrete slump of 4 1/2 inches - 5 inches (114 - 127 mm). Concrete admixtures may be used if necessary.
- E. Flatness Requirements:
  1. Overall FF 40.
  2. Local FF 30.
  3. Use ASTM E1155, Standard Test Method for Determining Floor Flatness and Levelness using the F number system.
- F. Hard-Steel Troweled Finished Concrete with no burn marks finish to ACI 302.1R for Class 5 floor.
- G. Concrete must be cured a minimum of 28 days prior to polishing.

### **3.02 PREPARATION**

- A. Remove ALL contaminants such as grease, glues, loose paint, oil, laitance, efflorescence and loose mortar from the cement. All visible imperfections should be

ground to create a uniform porous surface (unless the customer wants to accentuate those imperfections). Surface should not appear or feel like polished concrete, an accurate penetration/reaction will not occur.

B. Test concrete hardness, to determine the level of abrasive needed to begin the project.

### **3.03 APPLICATION**

A. Air, surface and product temperature must be at least 50 degrees during applications and until installation is complete.

B. Apply selected H&C Acetone Dye Stain following manufacturer's instructions.

C. After appropriate drying times have been applied, scrub and rinse floor until dye stain residue has been fully removed in accordance with the manufacturer's instructions.

D. After H&C Dye Stain accordance with the manufacturer's instructions, apply H&C Clear Hardener and Densifier to floor at 400- 500 sq. ft. per gallon, allowing the product to saturate the floor for 20-30 minutes, not allowing any areas to dry out during this time in accordance with the manufacturer's instructions. Add more as needed in order to maintain a uniformly wet surface.

E. After material has penetrated and is no longer glistening on the surface, continue grinding and polishing to the intended final surface profile and desired finish. If using a wet polishing method, or on integrally colored concrete, it is recommended to use an auto scrubber and water to remove residual slurry between abrasive disc grits.

F. Proper densification and color should be checked by general contractor, owner, or owner's representative prior to application protective finish step.

### **3.04 PROTECTIVE FINISH APPLICATION**

A. Sealing, Hardening and Polishing of Concrete Surface:

1. Apply protective finish a minimum of 10 days prior to any traffic on finished floor.
2. Only a certified applicator shall apply H&C Lithium Protective Finish. Applicable procedures must be followed as recommended by the product manufacturer and as required to match approved test sample.
3. Sealer: Apply two coats of H&C Lithium Protective Finish at a rate of 2500 square feet per gallon, using a Hudson sprayer and a microfiber applicator.
4. Burnish the floor between each coat with a hogs hair or black pad. Burnish to required sheen level.

5. Waterproofing, hardening, dust proofing, and abrasion resistance of the surface shall not change the natural appearance of the concrete, except for the sheen.

### **3.05 CLEANING**

- A. Remove spatter from adjoining surfaces, as necessary.
- B. Repair damages to surface caused by cleaning operations.

### **3.06 PROTECTION**

- A. Protect finished work until fully cured in accordance with manufacturer's recommendations.
- B. No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface; prevention is therefore essential.
  1. All hydraulic powered equipment must be diapered to avoid staining of the concrete.
  2. No trade shall park vehicles on the slab. If necessary to complete their scope of work, drop cloths will be placed under vehicles at all times.
  3. No pipe cutting machine will be used on the floor slab.
  4. Steel will not be placed on polished concrete surface to avoid rust staining.
  5. Do not permit acids and acidic detergents to contact with slab.
  6. Inform all trades that the slab must be protected at all times.

**END OF SECTION**

## **DIVISION 3 - CONCRETE**

### **SECTION 03 60 00**

#### **GROUT**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Providing grout where indicated on the Drawings.
- B. Related Work Specified Elsewhere:
  - 1. Cast-in-Place Concrete: Section 03 30 00.
- C. Individual grouting requirements as specified in various other sections of these Specifications.

##### **1.02 QUALITY ASSURANCE**

- A. Reference Standards.
  - 1. American Concrete Institute: ACI 308, Recommended Practice for Curing Concrete.
  - 2. American Society for Testing and Materials:
    - a. ASTM C 33, Concrete Aggregates.
    - b. ASTM C 150, Portland Cement.
    - c. ASTM C 1019, Standard Test Method for Sampling and Testing Grout.
    - d. ASTM C 476, Standard Specification for Grout for Masonry.
    - e. ASTM 404, Standard Specification for Aggregates for Masonry Grout.

##### **1.03 SUBMITTALS**

- A. Submit design mixes or product data in accordance with Section 01300 - SUBMITTALS.

##### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Prevent moisture damage and contamination of materials.
- B. Store materials in undamaged condition with seals and labels intact as packaged

by the manufacturer.

## **1.05 JOB CONDITIONS**

A. Protect against high and low temperatures and bad weather in accordance with American Concrete Institute standards for placement of concrete.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. Grout (Sand/Cement).

1. Portland Cement: ASTM C 150 Type I. (I Norm., II Sulfate R., III High Early.)
2. Sand: ASTM C 33, fine aggregate.

B. Water: Potable quality, free from deleterious amounts of acids, alkalis, and organic substances.

C. Non-Shrink, Non-Metallic Grout: Factory premixed material containing no corrosive irons, aluminums, chemicals or gypsums.

1. Grouts containing water reducers, accelerators, or fluidifiers shall have no drying shrinkage greater than the equivalent sand cement and water mix as tested per ASTM C 596.
2. Grout shall be non-shrink before initial set and show no expansion after set as tested per ASTM C 596.
3. Initial set of grout not less than 60 minutes per ASTM C 191 test.
4. Use Type I cement in grout formulation.
5. Acceptable Manufacturers: U.S. Grout Corporation; FIVE STAR; or equal.

### **2.02 GROUT QUALITY**

A. Grout (Sand/Cement): Mixture of Portland Cement, fine aggregate and water in the same proportions used in cast-in-place concrete with coarse aggregate omitted. Use ready-mix type unless otherwise approved by the Architect.

B. Non-Shrink Grout: Use ready-mix type requiring only the addition of water. Do not add other materials. Water requirement proportions shall conform to manufacturer's specifications for the desired mix consistency.

C. Grout shall meet the requirements of ASTM C476 course grout and shall reach a minimum compressive strength of 3000 pounds per square inch at 28 days.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

#### **A. Forming.**

1. Use forming procedures that allow proper and complete placement of grout.
2. Anchor support elements so no movement is possible.
3. Remove supports only after grout has hardened.
4. Pre-treat with forming oils wood forms that may absorb moisture.

#### **B. Preparation of Surface.**

1. Grout (Sand/Cement): Clean areas to be grouted free of oil, grease, laitance, dirt and other contaminants. Remove loose material. Remove rust, paint, and oil from metal components in contact with grout.
2. Non-Shrink Grout: Prepare in accordance with manufacturer's printed instructions.

### **3.02 MIXING**

#### **A. Time.**

1. Grout (Sand/Cement): In accordance with requirements for cast-in-place concrete.
2. Non-Shrink Grout: In accordance with manufacturer's printed instructions.

### **3.03 PLACING**

#### **A. Grout (Sand/Cement): Place and cure grout as follows:**

1. Following surface preparation, saturate the concrete with water; then remove excess water and brush on a coat of neat cement. Place grout while neat cement is wet.
2. Place in a single pour. Straight-edge exposed grout surface for trueness; consolidate and finish with a steel trowel.
3. Cure and seal in accordance with ACI 308.
4. After curing, fill scored joints with joint sealer.

**B. Non-Shrink, Non-Metallic Grout:** Perform grout placement in accordance with the recommendations of ACI and the manufacturer's published specifications for mixing and placing. Place non-shrink, non-metallic grout only where indicated on the Drawings.

**END OF SECTION**

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## **DIVISION 4 - MASONRY**

### **SECTION 04 05 13**

#### **MASONRY MORTARING**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Mortar for brick and concrete masonry units.
  - 1. Use pigmented mortar in decorative split face CMU and exterior brick walls. Allow for one (1) color for each masonry type.
- B. Related Work Specified Elsewhere.
  - 1. Joint Reinforcement: Section 04 01 65.
  - 2. Unit Masonry: Section 04 20 00.

###### **1.02 QUALITY ASSURANCE**

- A. Comply with applicable provisions of latest edition of:
  - 1. ASTM C 91: Specifications for Masonry Cement.
  - 2. ASTM C 144: Aggregate for Masonry Mortar.
  - 3. ASTM C 270: Specification for Mortar for Unit Masonry.

###### **1.03 SUBMITTALS**

- A. Furnish list of materials and manufacturers.

###### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Store materials off the ground, under cover, and in a dry location.

##### **PART 2 - PRODUCTS**

###### **2.01 MATERIALS**

- A. Masonry Cement: ASTM C 91: Type S, N and M, supplied by one manufacturer.

- B. Sand: Clean, well graded per ASTM C 144.
- C. Water: Potable.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Admixture: Not permitted without written approval.
- F. Bond Beam Grout: See Section 03 60 00 GROUT.
- G. Grout for Setting Bearing Plates and Structural Steel: Non-shrink, cement based, non-metallic, meeting requirements of ASTM C-1107.
  - 1. Sure-Grip Utility Grout by Dayton Superior Corp., Philadelphia, PA, or approved substitution.

## **PART 3 - EXECUTION**

### **3.01 MIXING MORTARS**

- A. Measure sand and any part bags of mortar by the use of satisfactory measuring boxes.
- B. Concrete Masonry Units: One part natural masonry cement, 2-1/4 to 3 parts sand by volume, ASTM C270, Type S above grade, Type M below grade.
- C. Brick: ASTM C270, Type N.
- D. Mix mortars thoroughly by machine in accord with the manufacturer's directions to meet the requirements of ASTM C 270.
- E. Do not re-temper or use mortar after initial set.

**END OF SECTION**

## **DIVISION 04 - MASONRY**

### **SECTION 04 23 00**

#### **GLASS UNIT MASONRY**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Glass masonry units.
- B. Mortar bed and pointing mortar.
- C. Perimeter treatment.

###### **1.02 QUALITY STANDARDS**

- A. ASTM A 123/A 123M – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- B. ASTM C 144 – Standard for aggregate for Masonry Mortar
- C. ASTM C 150 – Standard for Portland Cement.
- D. ASTM C 270 – Standard Specification for Mortar for Unit Masonry.
- E. ASTM C 780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- F. DIN 52290-2:1981-05 - Security glazing; testing the bullet-resistance and classification
- G. EN 1522 - Windows, doors, shutters and blinds - Bullet resistance - Requirements and classification
- H. EN 13501-2:2016 - Fire classification of construction products and building elements
- I. EN 1364-1:2015 - Fire resistance tests for non-loadbearing elements

### **1.03 SUBMITTALS**

- A. Product Data: Provide data for glass units and accessories.
- B. Samples: Submit two glass units and two curved units illustrating color, design, and face pattern.
- C. Manufacturer's Installation Instructions: Indicate special procedures, positioning of reinforcement, perimeter conditions requiring special attention.

### **1.04 QUALIFICATIONS**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept glass units on site on pallets; inspect for damage.

### **1.06 EXTRA MATERIALS**

- A. Supply five of each type and size of glass unit for Owners use in maintenance of project.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Seves Glass Block, Inc., Cleveland OH, 44147.
- B. Approved substitution.

### **2.02 GLASS UNITS**

- A. Solid Glass Units: Made of one piece with joint key to assist mortar bond. Certified as bullet proof in class FB4 according to regulations DIN 52290-2 and EN 1522. 90 minute fire resistance rating, E-90. Basis of design 1919/8 BSH20 Clearview.

- 1. Nominal Size: 8 inch by 8 inch by 4 inch
  - 2. Color: Clear glass
-

3. Pattern and Design: Select from manufacturer's standard line.
4. Compressive Strength: 400-600 psi.

B. Provide specially shaped units where indicated, including corners, curved units and end units.

### **2.03 ACCESSORIES**

A. Panel Reinforcement: Steel, galvanized after fabrication to 1.3 oz/sq ft. in accordance with ASTM A 123/A 123M.

1. Side Rods: Two 9-gage rods spaced 2 inches apart.
2. Cross Rods: 14-gage rods welded 8 inches on center.

B. Perimeter Channel: Extruded aluminum channel profile, 4-3/4 inch by 1-1/4 inch by 1/8 inch size, one piece per length installed, uncoated finish.

C. Asphalt Emulsion: Water Based

### **2.04 MORTAR AND POINTING MATERIAL**

A. Mortar: ASTM C 270, Type M using the Proportion specification as specified in Section 04 05 13.

B. Stain Resistant Pointing Mortar: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate, equal to 2 percent Portland cement by weight.

C. Pointing Sealant: acrylic type, as specified in Section 07 92 00.

### **2.05 MORTAR MIXING**

A. Mix mortar ingredients in accordance with Section 04 05 13.

B. Thoroughly mix mortar ingredients in accordance with ASTM C 270 in quantities needed for immediate use.

C. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

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- A. Verify that openings are ready to receive work.

### **3.02 PREPARATION**

- A. Clean glass units of substances that may impair bond with mortar or sealant.
- B. Establish and protect lines, levels, and coursing.
- C. Protect elements surrounding the work of this section from damage and disfigurement.

### **3.03 INSTALLATION**

- A. Erect glass units and accessories with manufacturer's instructions.
  - B. Locate and secure perimeter metal channel.
  - C. Coat sill under units with asphalt emulsion as a bond breaker, and allow drying.
  - D. Set panel anchors in mortar bed directly over coating.
  - E. Provide full mortar joints. Furrowing is not permitted. Remove excess mortar.
  - F. Maintain uniform joint width of  $\frac{1}{4}$  inch.
  - G. Place panel reinforcement at every second horizontal joint in full mortar bed and at first course above and below openings within the glass unit panel.
  - H. Lap reinforcement joints 6 inches. Discontinue reinforcement at expansion joints.
  - I. Isolate panel from adjacent construction on sides and top with expansion strips concealed within perimeter trim. Keep expansion joint voids clear of mortar.
  - J. Shore assembly until setting bed will maintain panel in position without movement.
  - K. To accommodate pointing mortar, rake out joints  $\frac{5}{8}$  to  $\frac{3}{4}$  inch.
  - L. Fill joints with pointing mortar. Pack into voids. Neatly tool surface to concave profile.
  - M. Rake out joint  $\frac{3}{8}$  inch to accommodate sealant.
  - N. Place sealant in mortar joints in accordance with Section 07 92 00. Tool surface
-

to a concave profile.

- O. Remove excess sealant.

### **3.04 TOLERANCES**

- A. Variation from Joint Width: Plus 1/8 inch and minus 0 inches.
- B. Maximum Variation from Plane of Unit to Adjacent Unit: 1/32 inch.
- C. Maximum Variation of Panel from Plane: 1/8 inch.

### **3.05 CLEANING**

- A. Clean and polish faces of glass unit masonry, using materials and technique that will not scratch or deface units.

### **3.06 PROTECTION OF FINISHED WORK**

- A. Maintain protective boards at exposed external corners. Provide protection without damaging completed work.

**END OF SECTION**

## **DIVISION 5 - METALS**

### **SECTION 05 40 00**

#### **COLD-FORMED METAL FRAMING**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Load-bearing steel stud wall framing.
- B. Roof and soffit framing.
- C. Non-structural studs, bridging and accessories where indicated.

###### **1.02 REFERENCES**

- A. AISI - Specification for the Design of Cold-Formed Steel Structural Members.
- B. ASCE 7 – Minimum Design Loads for Buildings and Other Structures.
- C. ASTM A653 - Steel Sheet, Zinc-Coated Galvanized or Zinc-Iron Alloy-Coated by the Hot-Dip Process.
- D. ASTM A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- E. ASTM A1003 – Standard Specification for Steel Sheet, Carbon, Metallic and Nonmetallic-coated for Cold-Formed Framing Members.
- F. ASTM C955 – Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
- G. ASTM C1007 – Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
- H. ASTM C1513 0 Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
- I. AWS D1.3: Structural Welding Code Sheet Steel.
- J. AWS Welders Qualifications: Standard Qualification Procedure.

### **1.03 SUBMITTALS**

- A. Shop drawings indicating framing layout, components, connections, fastenings, and pertinent details. Drawings and structural calculations shall be sealed by a Professional Engineer licensed in the State in which the Project is located.
- B. Product Data: Indicate framing components, sizes, materials, finishes, and accessories.
- C. Welder Certifications: As required by AWS D1.3/D1.3M.

### **1.04 QUALITY ASSURANCE**

- A. Manufacturer: Current member of SSMA.
- B. Installer Qualifications: Minimum 5 years' experience in work of this Section.
- C. Calculate structural properties of framing members in accordance with AISI Specifications.
- D. Design framing under the direct supervision of a Professional Structural Engineer with minimum 2 years' experience in the work of this Section and licensed in the State in which the Project is located.
- E. Design load bearing wall stud system to withstand:
  - 1. Live and dead loads in accordance with the Building Code and the structural loads indicated on the notes sheet. The more stringent shall apply.
  - 2. Wind pressure loads in accordance with ASCE 7-16.
  - 3. Maximum deflection under loading of  $L/240$  without sheathing materials.
- F. Design roof system to withstand:
  - 1. Live, snow, and dead loads in accordance with the Building Code and the structural loads indicated on the notes sheet. The more stringent shall apply.
  - 2. Wind pressure loads in accordance with ASCE 7-16.
  - 3. Maximum deflection under loading of  $L/360$  for live load or snow load only and  $L/240$  for dead plus live/snow.
- G. Design system to accommodate construction tolerances, deflection of building structural members, and clearances at openings.

H. Welder Qualifications: AWS D1.3/D1.3M.

## **1.05 DELIVERY AND STORAGE**

A. In accordance with ASTM C1007 and this section. Deliver materials to job site and store in adequately ventilated dry locations. If it is necessary to store materials outside, stack off the ground, properly support on a level platform, and fully protect from the weather. Handle materials carefully to prevent damage. Replace damaged items with new.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Clark Dietrich Building Systems, Baltimore, MD.
- B. Marino/WARE, South Plainfield, NJ.
- C. Approved substitution.

### **2.02 MATERIALS**

- A. Form framing members of galvanized sheet steel conforming to ASTM A653, coating weight G60.
- B. Fabricate components to ASTM C955.
- C. Structural studs, joists, bridging and accessories shall have a minimum yield strength of 50,000 psi for 16 gage and thicker materials, and 33,000 psi for material lighter than 16 gage. Studs, joists and roof framing shall be SSMA stud profile, C-shaped, punched for utility access. Top and bottom tracks shall have 1 ¼" high legs, minimum. Provide closure for ends of joists/roof framing with rim track.
- D. Touch-Up Paint: PPG Aquapon Zinc Rich Primer, 97-670 VOC Series.
- E. Hat Channels: Roll formed, hat shaped section of 20-gauge corrosion resistant steel. Size 7/8" x 2-9/16".

### **2.03 ACCESSORIES**

- A. Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.

- B. Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.
- C. Fasteners: ASTM C1513; self-drilling, self-tapping screws.
- D. Welding Electrodes: AWS D1.3/D1.3M; type required for materials being welded.

#### **2.04 FABRICATION**

- A. Prefabricate framing components using templates. Field fabrication prohibited except for minor alterations to accommodate site conditions.
- B. Cut members square and with tight fit to adjacent framing.
- C. Assemble components using screw connection, welding, or clinching methods. Welding to conform to AWS D1.3/D1.3M.
- D. Fabricate straight, level, and true, without warp or rack.
- E. Fabrication Tolerances: In accordance with ASTM C955.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION - GENERAL**

- A. Install framing components in accordance with ASTM C1007, manufacturer's instructions, and approved Shop Drawings.
- B. Welding: In accordance with AWS D1.3/D1.3M.
- C. Make provisions for erection stresses. Provide temporary alignment and bracing.

#### **3.02 INSTALLATION – AXIALLY AND NON-AXIALLY LOADED STUD FRAMING**

- A. Place top and bottom tracks in straight lines with ends butted. Fasten tracks at maximum 12 inches on center unless otherwise indicated in shop drawings.
- B. Place studs at spacing indicated and not more than 2 inches from abutting walls and at each side of openings.
- C. Connect studs to top and bottom tracks. Use deflection compensating top track at non-axially loaded studs only.
- D. Construct corners using minimum of three studs.

- E. Do not splice studs.
- F. Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.
- G. Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.
- H. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- I. Provide shear walls at locations indicated.

### **3.03 INSTALLATION – ROOF FRAMING**

- A. Place rafters and other roof framing at spacings indicated and not more than 2 inches from abutting walls. Connect members to supports using fastener method.
- B. Set members parallel and level; install lateral bracing and bridging where indicated.
- C. Locate rafters directly over bearing studs or provide load distribution member.
- D. Provide additional rafters around openings that interrupt one or more rafters.
- E. Do not splice joists.
- F. Provide web stiffeners at reaction points and points of concentrated loads.
- G. Provide end blocking where rafter ends are not otherwise restrained from rotation.
- H. Members must have at least 1.5 inch of bearing and reinforced over bearings where required to prevent web crippling.

### **3.04 FASTENING**

- A. Fasten framing members together by welding or by using self-drilling or self-tapping screws. Welding procedure and electrodes or screw connections as stated/shown in Shop Drawings. Conform to AWS D1.3 for welded connections.

### **3.05 WELDING**

- A. Comply with AWS D1.3 for procedures, appearance and quality of welds.

- B. Welders certified and qualified in accord with AWS requirements for material being used.

### **3.06 TOUCH-UP PAINTING**

- A. Immediately following erection, thoroughly clean and spot prime welds and rusted areas with specified paint.

**END OF SECTION**

## DIVISION 05 - METALS

### SECTION 05 44 00

#### COLD-FORMED STEEL TRUSSES

##### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Includes cold-formed steel roof trusses and related items.

##### 1.02 REFERENCES

- A. ASTM A1003/A1003M *“Standard Specification for Steel Sheet, Carbon, Metallic and nonmetallic-Coated for Cold-Formed Framing Members.”*
- B. ASTM A780 *“Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.”*
- C. AWS D1.1 *“Structural Welding Code - Steel.”*
- D. AWS D1.3 *“Structural Welding Code - Sheet Steel.”*
- E. Structural Building Components Association - Cold-Formed Steel Building Component Safety Information (CFSBCSI).
- F. American Iron and Steel Institute, North American Specification for the Design of Cold-Formed Steel Structural Members.
- G. American Iron and Steel Institute Standard for Cold-Formed Steel Framing-AISI S240.

##### 1.03 PERFORMANCE REQUIREMENTS

- A. AISI *“Specifications”*: Calculate structural characteristics of cold-formed steel truss members according to American Iron and Steel Institute *“North American Specification for the Design of Cold-Formed Steel Structural Members.”*
- B. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: As indicated on drawings.
  - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Roof Trusses: Vertical deflection of 1/240 of the span.

#### **1.04 SUBMITTALS**

- A. Product Data: For each type of product and accessory indicated.
- B. Shop Drawings: Show layout, spacing, sizes, thicknesses, and types of cold-formed metal framing, fabrication, and fastening and anchorage details, including mechanical fasteners.
  - 1. For cold-formed metal framing indicated to comply with design loads, include individual truss drawings signed and sealed by the qualified Professional Engineer responsible for their preparation. Engineer shall be licensed in the State where the Project is located. Include:
    - a. Description of design criteria.
    - b. Engineering analysis depicting member stresses and truss deflection.
    - c. Truss member type, sizes and thickness and connections at truss joints.
    - d. Truss support reactions.
    - e. Top chord, Bottom chord and Web bracing requirements.
  - 2. Submit final roof plan drawings sealed and signed by a qualified registered Professional Engineer depicting final installed truss assembly. Include:
    - a. All truss to truss connections.
    - b. All truss to structure (bearing) connections.
    - c. Plan and details for the location of all permanent lateral and diagonal bracing and/or blocking required in the top chord, web, and bottom chord planes.
- C. Welding certificates.
- D. Qualification Data.
- E. Product test reports.
- F. Research/evaluation reports.

#### **1.05 QUALITY ASSURANCE**

- A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements.
- B. Fabricator Qualifications: Fabrication shall be performed in a quality controlled manufacturing environment by a cold-formed steel truss fabricator with experience fabricating cold-formed steel trusses equal in material, design, and scope to the trusses required for this Project.

- C. Installer Qualifications: Installation of cold-formed steel truss roof or floor assembly shall be performed by an installer with experience installing cold-formed steel trusses equal in material, design and scope to the trusses required for this Project.
- D. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code – Sheet Steel".

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in manufacturer’s unopened containers or bundles, fully identified by name, brand, type and grade. Exercise care to avoid damage during unloading, storing and erection.
- B. Store trusses on blocking, pallets, platforms or other supports off the ground and in an upright position sufficiently braced to avoid damage from excessive bending.
- C. Protect trusses and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep trusses free of dirt and other foreign matter.

**1.07 PROJECT CONDITIONS**

- A. During construction, adequately distribute all loads applied to trusses so as not to exceed the carrying capacity of any one truss.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Manufacturer: Ultra-Span® Truss Manufacturer. Contact MiTek® at 1-866-902-3447 or visit [www.mii.com](http://www.mii.com). A list of fabricators that supply this state are:

All-Span, Inc.	888-567-5797
Steel Construct Systems, LLC	704-781-5575
Trigon Steel Components, Inc.	302-947-8335
Or Approved Substitute.	

**2.02 COMPONENTS**

- A. System components: ULTRA-SPAN® cold-formed steel roof truss components or approved substitute.

- B. Provide manufacturer's standard steel truss members, bracing, bridging, blocking, reinforcements, fasteners, and accessories with each type of steel framing required, as recommended by the manufacturer for the applications indicated and as needed to provide a complete cold-formed steel truss roof or floor assembly.

### **2.03 MATERIALS**

- A. For all chord and web members: Fabricate components of structural quality steel sheet per ASTM A1003 with a minimum yield strength of 50,000 psi. Bracing, bridging and blocking members: Fabricate components of commercial quality steel sheet per ASTM A1003 with a minimum yield strength of 33,000 psi.
- B. Finish: Provide components with protective zinc coating complying with ASTM A1003, minimum G60 coating.
- C. Fastenings:
  - 1. Manufacturer recommended self-drilling screws with corrosion-resistant plated finish. Fasteners shall be of sufficient size and number to ensure the strength of the connection.
  - 2. Welding: Comply with AWS D1.1 when applicable and AWS D1.3 for welding base metals less than 1/8" thick.
  - 3. Other fasteners as accepted by truss engineer.

### **2.04 FABRICATION**

- A. Factory fabricate cold-formed steel trusses plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and the requirements of this Section.
  - 1. Fabricate truss assemblies in jig templates.
  - 2. Cut truss members by sawing or shearing or plasma cutting.
  - 3. Fasten cold-formed steel truss members by screw fastening, or other methods as standard with fabricator.
    - a. Locate mechanical fasteners and install according to cold-formed steel truss component manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.
- B. Care shall be taken during handling, delivery, and erection. Brace, block, or reinforce the truss as necessary to minimize member and connection stresses. Refer to SBCA – CFSBCSI.
- C. Fabrication Tolerances:
  - 1. Overall Length: Fabricate each cold-formed steel truss to the maximum allowable tolerance as follows:

- a. Truss length up to 30 ft – 1/2" tolerance.
- b. Truss length over 30 ft – 3/4" tolerance.
2. Overall Height: Fabricate each cold-formed steel truss to the maximum allowable tolerance as follows:
  - a. Truss height up to 5 ft – 1/4" tolerance.
  - b. Truss height over 5 ft – 1/2" tolerance.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Examine structure, substrates and installation conditions. Do not proceed with cold-formed steel truss installation until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

### **3.02 INSTALLATION, GENERAL**

- A. Erection of trusses, including proper handling, safety precautions, installation bracing and other safeguards or procedures is the responsibility of the Contractor and Contractor's installer. Refer to SBCA – CFSBCSI or contact qualified registered Professional Engineer.
- B. Erect trusses with plane of truss webs vertical and parallel to each other, accurately located at design spacing indicated.
- C. Provide proper lifting equipment, including spreader bar, suited to sizes and types of trusses required, applied at lift points recommended by truss fabricator. Exercise care to avoid damage to truss members during erection and to keep horizontal bending of the trusses to a minimum.
- D. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured. Exercise care and provide installation bracing required to prevent collapse of trusses during erection and prior to installing permanent bracing system.
- E. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

- F. Provide framing anchors as indicated or accepted on the engineering design drawing or erection drawings. Anchor trusses securely at bearing points.
- F. Install insulation, specified in Division 07, in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- G. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- H. Install trusses plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations.
  - 1. DO NOT cut truss members without prior approval of truss engineer.
  - 2. Fasten cold-formed steel trusses to supports by screw fastening, welding or other methods, as standard with fabricator.
    - a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to cold-formed truss manufacturer's instructions with screw penetrating joined members by not less than three exposed screw threads.
  - 3. Install trusses in one-piece lengths, unless splice connections are indicated.
  - 4. Provide installation bracing and leave in place until trusses are permanently braced/restrained.

### **3.03 TRUSS INSTALLATION**

- A. Install, bridge and brace trusses according to shop drawings and requirements in this section.
- B. Truss Spacing: 24 inches, max. Space per sealed truss drawings.
- C. Do not alter, cut, or remove framing members or connections of trusses.
- D. Erect trusses with plane of truss webs plumb and parallel to each other; align and accurately position at spacing indicated.
- E. Erection Tolerances:
  - 1. Limit overall bow or bow in any chord member to the lesser of L/200 or 2 inches. L equal to length of truss or member.
  - 2. Limit out-of-plane plumb to the lesser of L/50 or 2 inches. L equal to the height of the truss.
  - 3. Space individual trusses no more than plus or minus 1/8 inch (3 mm) from

plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

- F. Erect trusses without damaging framing members or connections.
- G. Anchor trusses securely at all points of support, per shop drawings.
- H. Install continuous bridging and permanently brace trusses per the shop drawings.
- I. Perform all truss to truss connections per the shop drawings.

#### **3.04 FIELD QUALITY CONTROL**

- A. Testing: Owner shall engage a qualified independent testing and inspection agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspection.
- C. Testing agency shall report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

#### **3.05 REPAIRS AND PROTECTION**

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

**END OF SECTION**

## **DIVISION 5 - METALS**

### **SECTION 05 50 00**

#### **METAL FABRICATIONS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. The work in this section shall include bar screen fabrication, stairs, platforms, grating support and other miscellaneous metal items fabricated from steel and aluminum not covered in other sections.

###### **1.02 REFERENCES**

- A. AISC: Specification for the design, fabrication, and erection of structural steel for buildings.
- B. AISC: Code of standard practice.
- C. AWS: Structural welding code.
- D. Aluminum Association: Specifications for aluminum structures.
- E. ASTM B221 aluminum alloy extruded bars, rods, shapes and tubes.
- F. ASTM A36: Specification for Structural Steel.
- G. ASTM A307: Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- H. FEMA Technical Bulletin 8: Corrosion Protection for Metal Connectors and Fasteners in Coastal Areas
- I. ASCE 24: Flood Resistant Design and Construction

###### **1.03 QUALITY ASSURANCE**

A. Standards: Comply with applicable provisions of the referenced standards.

###### **1.04 SUBMITTALS**

A. Submit shop drawings for review. Take field measurements prior to preparation

of shop drawings.

B. Manufacturer's name and type of shop paint.

C. Submit sealed design calculations for equipment platforms and platform foundations. Calculations shall be based on applicable building and safety codes. Calculations shall include member sizes, deflections, connections, lateral stability, etc. Design calculations shall be sealed by a professional engineer registered in Delaware. Unless noted otherwise, platforms shall be designed for a 100 psf uniform live load or 2,000 pound concentrated live load in addition to the equipment load.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. Plates, Shapes, Bars: ASTM A 36, steel.

B. Anchor Bolts: ASTM A307 steel.

C. Pipe: ASTM A 53, Schedule 40, black.

D. Aluminum Extrusions: ASTM B221, Alloy 6063 T6.

E. Aluminum Structural Shapes And Plates: ASTM B209, Alloy 6061 T6.

F. Shop Paint: See Section 09900 - PAINTING.

### **2.02 FABRICATION, GENERAL**

A. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Smooth exposed edges.

B. 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.

C. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.

D. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

### **2.03 ITEMS**

- A. Anchor Bolts: Fabricate of ASTM F1554-07a unless noted otherwise, threaded one end with nut and washer, other end as detailed. Shop paint portion not embedded in mortar in concrete.
- B. W-Shape Steel Lintels: Fabricate to sizes shown of ASTM A992 steel with a minimum yield stress of 50 ksi. Provide over recesses or openings, including openings for mechanical trades, where concrete lintels are not specified. Not less than 8 inch bearing at each end. Shop paint.
- C. Steel Lintels: Fabricate to sizes shown of ASTM A992 steel. Provide over recesses or openings including openings for mechanical trades, where concrete lintels are not specified. Not less than 8" bearing at each end. Shop paint.
- D. Joist/Beam Bearing Plate: Fabricate of A36 steel to indicated size with welded anchors with bent end. Shop paint.
- E. Bifold Garage Door Sill Angles: Refer to section 08 35 00 – BIFOLD DOORS.
- F. Pipe Bollards: Galvanized steel pipe, Grade 40, to required length. Shop paint.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION - GENERAL**

- A. Perform cutting, drilling and fitting required.
- B. Set work accurately in place, alignment and elevation, measured from established lines and levels. Provide anchorage devices and fasteners where necessary for items built into concrete or masonry.
- C. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar, using commercial non shrink grout material specified in Section 03600 - GROUT.
- D. Pipe Bollards: Set in concrete as specified in Section 03300 - CAST-IN-PLACE CONCRETE. Fill with concrete as specified in Section 03600 - GROUT. Round off top for drainage.
- E. Furnish sill angles or other items to concrete or masonry contractor for setting in place.
- F. Touch up shop paint after installation. Clean field welds, bolted connections and abraded areas, and apply same type paint as used in shop.

G. Paint surfaces of aluminum in contact with other materials with two coats of bituminous paint.

**END OF SECTION**

## **DIVISION 5 – METALS**

### **SECTION 05 51 00**

#### **STEEL GUARDRAILS**

##### **PART 1 – GENERAL**

###### **1.01 SECTION INCLUDES**

A. Steel guardrails at interior stairs.

###### **1.02 PERFORMANCE REQUIREMENTS**

A. Structural Performance of Handrails and Railing Systems: Engineer, fabricate, and install handrails and railing systems to comply with requirements of ASTM E 985 for structural performance based on the following:

1. Testing performed according to ASTM E 894 and E 935.
2. Structural computations.

B. Structural Performance: Engineer, fabricate, and install handrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each of the respective components of each metal fabrication.

1. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
  - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
  - b. Uniform load of 50 lbf per linear foot (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf per linear foot (1460 N/m) applied vertically downward.
  - c. Concentrated and uniform loads above need not be assumed to act concurrently.
2. Handrails not serving as Top Rails: Capable of withstanding the following loads applied as indicated:
  - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
  - b. Uniform load of 50 lbf per linear foot (730 N/m) applied in any direction.

- c. Concentrated and uniform loads above need not be assumed to act concurrently.
- 3. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf (890 N) applied to one sq. ft. (0.09 sq. m) at any point in the system including panels, intermediate rails, balusters, or other elements composing the infill area.
  - a. Above load need not be assumed to act concurrently with loads on top rails of railing systems in determining stress on guard.

### **1.03 SUBMITTALS**

- A. Product data for railings.
- B. Shop drawings:
  - 1. Submit Manufacturer's approved shop drawings detailing plans, sections and elevation views of each product to be installed. Shop drawings shall include engineered calculations of all steel railing and its components including anchorage to the concrete. Calculations shall show all components and anchorages are capable of supporting the loads required. Calculations shall be sealed by an engineer registered in the state the project is located in.
  - 2. Coordinate with locations listed on Contract Drawings.
- C. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

### **1.04 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Firm experienced in producing steel guardrails similar to those indicated for this Project with a record of successful in-service performance and with sufficient production capacity to produce required units without delaying the Work.
- B. Installer Qualifications: Arrange for steel guardrail installation specified in this Section by the same firm that fabricated them.
- C. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code—Steel" and AWS D1.3 "Structural Welding Code—Sheet Steel."

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. First State Fabrication, LLC, Seaford, DE.

B. Approved substitution.

## **2.02 FERROUS METALS**

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

B. Steel Tubing

1. Cold-Formed Steel Tubing: ASTM A 500.
2. Hot-Formed Steel Tubing: ASTM A 501.

C. Steel Pipe: ASTM A 53, standard weight (schedule 40), unless otherwise indicated.

1. Black finish, unless otherwise indicated.

D. Uncoated Structural Steel Sheet.

1. Cold-Rolled Structural Steel Sheet: ASTM A1008, grade as follows:
  - a. Grade A, unless otherwise indicated or required by design loading.
2. Hot-Rolled Structural Steel Sheet: ASTM A 570/A 570M, Grade 30, unless otherwise indicated or required by design loading.

E. Uncoated Steel Sheet: Commercial quality, product type (method of manufacture) as follows:

1. Cold-Rolled Steel Sheet: ASTM A 1008/1008M.
2. Hot-Rolled Steel Sheet: ASTM A 1011/1011M.

F. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.

## **2.03 FASTENERS**

A. General: Provide plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating, for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

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

C. Machine Screws: ANSI B18.6.3 (ANSI B18.6.7M).

D. Lag Bolts: ANSI B18.2.1 (ANSI B18.2.3.8M).

- E. Plain Washers: Round, carbon steel, ANSI B18.22.1 (ANSI B18.22M).
- F. Lock Washers: Helical, spring type, carbon steel, ANSI B 18.21.1.
- G. Expansion Anchors: Anchor bolt and sleeve assemblies of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
  - 1. Material: Carbon steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.

## **2.04 PAINT**

- A. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements of FS TT-P-664.
- B. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12.

## **2.05 GROUT**

- A. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- B. W.R Bonsal Company or approved substitution.

## **2.06 FABRICATION, GENERAL**

- A. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- B. Shear and punch metals cleanly and accurately.
- C. Remove sharp or rough areas on exposed surfaces.
- D. Ease exposed edges to a radius of approximately 1/32 inch (1mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Weld corners and seams continuously.
- F. 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. Locate joints where least conspicuous.

G. Shop Assembly: Preassemble in shop to greatest extent possible to minimize field splicing and assembly. Use connections that maintain structural value of joined pieces.

## **2.07 STEEL PIPE HANDRAILS AND RAILING SYSTEMS**

A. General: Fabricate pipe handrails and railing systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of pipe, post spacing, and anchorage, but not less than that required to support structural loads.

B. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.

C. Form changes in direction of handrails and rails as detailed.

## **2.08 FINISHES**

A. General: Finish metal stairs after assembly.

1. Comply with NAAMM "Metal Finishes Manual" for recommendations on application and designations of finishes.

B. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed units:

1. Interiors (SSPC Zone 1A): SSPC SP 3 "Power Tool Cleaning."

C. Apply shop primer to uncoated surfaces, except those with galvanized finish or those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA 1 "Paint Application Specification No. 1" for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installing anchorages, including concrete inserts, weld plates, and anchor bolts. Coordinate delivery of such items to Project site.

### **3.02 INSTALLATION, GENERAL**

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing steel stairs to in-place construction; include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors as required.

**END OF SECTION**

**DIVISION 05 – METALS**  
**SECTION 05 73 00**  
**ALUMINUM GUARDRAILS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

A. Aluminum railing at edges of balconies and at other exterior areas such as steps and ramps.

**1.02 REFERENCES**

A. All references are the latest version, unless noted otherwise.

B. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

C. ASTM B 210- Standard Specification for Aluminum and Aluminum Alloy Drawn Seamless Tubes.

D. ASTM B 221-Standard Specification for Aluminum and Aluminum-alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

E. ASTM B 247- Standard Specification for Aluminum and Aluminum-Alloy Die Forgings, Hand Forgings, and Rolled Ring Forgings.

E. ASTM B 221-Standard Specification for Aluminum and Aluminum-alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

F. ASTM 429 – Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

G. ASTM C 1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (non-shrink).

H. ASTM E 488- Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.

I. AA 30- “Specifications for Aluminum Structures”.

### **1.03 PERFORMANCE REQUIREMENTS**

A. General: Handrails and railings shall withstand structural loading as determined by allowable design working stresses of materials based on the following standards.

1. Aluminum: AA30

B. Structural Performance: Provide handrails and railings capable of withstanding the following structural loads or the load in the 2021 International Building Code (whichever is greater) without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections:

1. Top Rail of Guards: Shall withstand the following loads:
  - a. Concentrated load of 200 lbf (0.89kN) applied at any point and in any direction.
  - b. Uniform load of 50 lbf-ft (0.07kN-m) applied horizontally and concurrently with uniform load of 100 lbf-ft. (0.14kN-m) applied vertically downward.
  - c. Concentrated and uniform loads above need not be assumed to act concurrently.
2. Handrails Not Serving as Top Rails: Shall withstand the following loads:
  - a. Concentrated load of 200 lbf (0.89kN) applied at any point and in any direction
  - b. Uniform load of 50 lbf-ft. (0.07kN-m) applied in any direction
  - c. Concentrated and uniform loads above need not be assumed to act concurrently.
3. Guards Infill Area: Shall withstand the following loads:
  - a. Concentrated horizontal load of 200 lbf (0.89kN) applied to a 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Loads need not be assumed to act concurrently, with loads on top rails in determining stress on guard.

C. Thermal Movements: Design handrails and railings to allow for movements resulting from 120-degree F (49 C) changes in ambient and 180-degree F (82 C) surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

D. Corrosion Resistance: Separate incompatible materials to prevent galvanic corrosion.

### **1.05 SUBMITTALS**

A. Submit under provision of Section 01300.

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:

1. Submit Manufacturer's approved shop drawings detailing plans, sections and elevation views of each product to be installed. Shop drawings shall include engineered calculations of all aluminum railing and its components including anchorage to the existing concrete. Calculations shall show all components and anchorages are capable of supporting the loads required. Calculations shall be sealed by an engineer registered in the state the project is located in.
2. Coordinate with locations listed on 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 (150mm) square representing actual product, color, and patterns.

## **1.06 QUALITY ASSURANCE**

A. Manufacturer's Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.

B. Installer Qualification: All products listed in this section should be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

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

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

## **1.08 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.

## **1.09 WARRANTY**

A. At project closeout, provide to the Owner or Owners Representative, an executed copy of the manufacturer's standard document outlining the terms, conditions and limitations of their Lifetime Limited Warranty.

### **Products with KynarXL™ Finish**

The KynarXL™ aluminum railing finish is guaranteed from peeling, cracking, or blistering for fifteen (15) years from the original installation date.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

A. Acceptable Manufacturer: Atlantic Aluminum Products Incorporated, which is located at 12144 Sussex Highway; Greenwood, DE 19950; Toll Free: 801-601-1870, Telephone: (302) 349-9091, Fax: (302) 349-0138, Email: aap@atlanticaluminumproducts.com, Web: aaprailing.com.

B. Or Approved Substitute.

### **2.02 MATERIALS**

A. Extrusion Alloy: Aluminum 6063-T5, 6063-T-6, 6061-T6, or 6005A-T61.

B. Screws and anchors: All screws and anchors are made of corrosion resistant material.

### **2.03 ORNAMENTAL RAILING SYSTEM**

A. Top Rail-200 Railing Series with Georgian Top and Square Pickets (two line).

1. Top Rail Profile: 1-13/16 inches (46.037 mm) wide by 1 inches (25.4mm) high.

B. Picket Selection-Standard Square Picket

1. Picket Dimension: 3/4 inch square (19.1 mm).

2. Picket Spacing: Picket spacing must disallow the passage of a 4 inch (101.6) sphere through the railing at any point.

C. Post

1. Post Dimension: 2-1/2 inches square (63.5mm) square.

D. Span

1. As noted on the Contract Drawings, not to exceed 60 inches (1828.8 mm).

E. Mounting Options

1. Surface Mount

F. Guardrail Height

1. 42 inches (1067 mm) above finished surface.

## **2.04 COLORS AND FINISHES**

A. Finishes:

1. Kynar-XL: Three part coat system (primer, paint, XL). Conforms to specification outlined in AAMA 2605 to achieve the highest possible corrosion defense and protects color pigments from chalking and fading. Color to be selected by owner/architect.

## **2.05 INFILL**

A. Vertical

1. Spacing is to disallow the passage of 4 inch (101.6 mm) sphere through the railing at any point.

## **2.06 FASTENERS**

A. Handrail Anchors: Select fasteners of type, grade and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads. Railing shall not be connected to existing masonry walls at their ends. Instead, provide post next to the masonry wall. Distance between post and wall shall prevent the passage of a 4" diameter sphere.

B. Handrail and Railing Component Anchors: Use fasteners fabricated from same basic metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.

1. Provide concealed fasteners for interconnecting railing components and for attaching them to together work, unless exposed fasteners are unavoidable.

## **2.07 FABRICATION**

- A. Assemble handrails and railings 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. Use connections that maintain structural value of joined pieces.
- B. Form changes in direction of railing members as shown in the Contract Drawings.
- C. Mechanical Connections: Fabricate handrails and railings by connecting members with railing manufacturer's standard concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- D. Brackets, Flanges, Fittings, and Anchors: Provide the manufacturer's standard wall brackets, flanges, miscellaneous fittings to connect the handrail and railing members to other construction.
- E. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
- F. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
- G. Cut, reinforce, drill and tap components as indicated on drawings to receive finish hardware, screws, and similar items.
- H. Close exposed ends of railing members with prefabricated end fittings.
- I. Provide mounted handrails walls returns at wall ends unless otherwise indicated. Close ends of returns, unless clearance between end railing and wall is ¼ inch (6mm) or less.

## **PART 3 - EXECUTION**

### **3.01 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.

### **3.02 PREPARATION**

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Clean surfaces thoroughly with soap and water after installation is completed.

C. Railing system shall incorporate fiberglass columns as shown in drawings. Railing manufacturer shall coordinate attachment to fiberglass columns or provide posts next to fiberglass columns to avoid attachment (provided that distance between fiberglass columns and railing post does not permit the passage of a 4" diameter sphere).

### **3.04 PROTECTION**

A. Protect installed products until completion of project.

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

**END OF SECTION**

# **ODIVISION 6 - WOOD AND PLASTICS**

## **SECTION 06 10 00**

### **ROUGH CARPENTRY**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Preservative and non-treated lumber, fastenings, and other items needed for rough carpentry.

##### **1.02 REFERENCES**

A. ASTM A307: Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

B. FS FF-B-561: Bolts, (Screw) Lag.

C. FS FF-N-105: Nails, Brads, Staples and Spikes: Wire, Cut and Wrought.

##### **1.03 QUALITY ASSURANCE**

A. Workmen: Provide workmen who are thoroughly familiar with the type of construction involved and the materials and techniques required.

B. Standards: Comply with pertinent codes and regulations, and with the standards listed in this section.

C. Conflicting Requirements: In event of conflict between pertinent codes and regulations and requirements of referenced standards or these Specifications, the provisions of the more stringent shall govern.

##### **1.04 PRODUCT HANDLING**

A. Protection:

1. Use all means necessary to protect lumber materials before, during and after delivery to the job site.
2. Deliver materials to job site and store, in a safe area and shored up off the ground surface.
3. Identify framing lumber as to grades, and store all grades separately from other grades.

4. Protect with adequate waterproof outer wrappings.
5. Use extreme care in the off-loading of lumber to prevent damage, splitting, and breaking of materials.

B. Replacements: In event of damage, immediately make repairs and replacements necessary at no additional cost to Owner.

## **PART 2 - PRODUCTS**

### **2.01 GRADE STAMPS**

A. Framing Lumber: Identify framing lumber by grade stamp of the appropriate lumber Inspection agency.

B. Other: Identify other materials by the appropriate stamp of the agency or association, or by such other means as approved.

C. Each piece of preservative treated lumber must bear stamp or imprint showing treatment and plant identification.

D. Plywood: Identify plywood at to species, grade, and glue type by the stamp of the American Plywood Association.

1. All plywood sheathing shall contain non-urethane waterproof glue.

### **2.02 MATERIALS**

A. Sizes: As shown on the drawings or as required for conditions.

B. All materials shall meet or exceed the following:

<u>ITEM</u>	<u>DESCRIPTION</u>
Structural Framing, KD: 2x6 to 3x12	Southern Pine 1200# Fiber Stress for Exterior, SPF No. 2 for interior (Bending Stress, Fb = 875psi, min.)
Preservative Treated Wood: Pressure impregnated with Alkaline Copper Quaternary (ACQ) conforming to AWWA Standard C2 2. for residential/commercial construction.	<ol style="list-style-type: none"> <li>1. Air or Kiln dry to 19% content or less after treatment.</li> </ol> Treat nailers, sills, furring, stripping and similar items in contact with concrete, masonry, steel.

Minimum Retention Rate:	0.40 lbs. per cubic foot with minimum penetration 2.5" or 85% of the sapwood
Treated Framing Lumber: 2x4 to 3x12	Southern Yellow Pine. SPIB Grade #2
Machine Bolts:	ASTM A307
Lag screws:	Fed. Spec. FF-B-561
Nails:	Fed. Spec. FF-N-105 (Note: Use galvanized or stainless steel 304 or 316 fasteners at exterior locations and with preservative treated lumber).
Plywood Sheathing, APA Trademarked:	APA Rated (C-D Grade) with water-proof glue, Exposure1, square edge unless noted otherwise.
Felt:	No. 15 or No. 30 asphalt saturated felt as indicated.
Framing Anchors:	Fabricated of galvanized steel. Provide framing anchors and hangers of the size and type recommended by the manufacturer for each use, including recommended nails. "Strong-Tie" manufactured by Simpson, San Leandro, CA 94577 or approved substitution.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

A. Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the Work.

### **3.02 WORKMANSHIP**

A. General: Rough carpentry shall produce joints true, tight, and well nailed, with all members assembled in accord with drawings and pertinent codes and regulations.

B. Selection of Lumber Pieces:

1. Carefully select members. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making connections.
2. Cut out and discard defects which will render a piece unable to serve its intended function. Lumber may be rejected by the Engineer, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
3. Shimming: Do not shim sills, joists, short studs, trimmers, headers, lintels, or other framing components.

### **3.03 TREATED LUMBER**

- A. General: Use preservative treated lumber for pads, blocking, nailers and grounds in contact with concrete, masonry or steel, or exposed to weather.
- B. Apply brush coat of same chemicals on cuts where cutting is necessary.

### **3.04 GENERAL FRAMING**

- A. General:
  1. In addition to framing operations normal to fabrication and erection indicated, install backing required for work of other trades.
  2. Set horizontal or sloped members with crown up.
- B. Bearings:
  1. Make bearings full unless otherwise indicated on the Drawings.
  2. Finish bearing surfaces on which structural members are to rest so as to give sure and even support. Where framing members slope, cut or notch ends as required to give uniform bearing surface.
- C. Plywood Sheathing:
  1. Place plywood with face grain perpendicular to supports and continuously over at least two supports. Provide edge support by means of ply-clips, tongue and groove panels or lumber blocking between rafters. Allow 1/8" spacing at panel ends and edges.
  2. Center joints accurately over supports. Stagger end joints of plywood panels to achieve a minimum of continuity of joints.
  3. Nail 4" O.C. at edges of panels and 6" O.C. at intermediate supports, unless noted otherwise in the contract drawings. Use nail type recommended by the APA.

4. Protection of Plywood: Protect plywood from moisture by use of waterproof coverings until plywood has in turn been covered with the next succeeding component. Refer to roofing specification for felt type.

### **3.05 FASTENING**

#### **A. Nailing:**

1. Use common wire nails or spikes.
2. Nail without splitting wood. Pre-bore as required. Replace split members.

**B. Bolting:** Drill holes 1/16 inch larger in diameter than the bolts being used. Drill straight and true from one side only. Bolt threads shall not bear on wood. Use washers under head and nut where both bear on wood; use washers under all nuts.

**C. Screws:** Pre-bore holes for lag screws and wood screws, same diameter as root of thread; enlarge holes to shank diameter for length of shank. Screw, do not drive, lag screws and wood screws.

**D. Framing Anchors:** Install in accord with the manufacturer's instructions. Every nail hole must be used.

### **3.06 CLEANING UP**

**A. General:** Keep premises in a neat, safe, and orderly condition at all times, free from accumulation of sawdust, cut ends, and debris.

### **3.07 BLOCKING AND BACKING**

**A.** Furnish and install all blocking and backing necessary to mount fixtures, accessories, equipment and furnishings specified.

**END OF SECTION**

## **DIVISION 6 – WOOD AND PLASTICS**

### **SECTION 06 41 00**

#### **ARCHITECTURAL WOOD CASEWORK**

##### **PART 1 – GENERAL**

###### **1.01 SECTION INCLUDES**

A. Wood Casework is shown on the drawings and is hereby defined as a type of architectural woodwork, which includes cabinets, cases, counters, shelves and enclosures of all kinds, including integral doors and plastic laminates.

B. Furnishing and installation of hardware for casework is included in this section.

###### **1.02 QUALITY ASSURANCE**

A. Conform to the applicable standards as established by the AWI and referenced herein.

###### **1.03 SUBMITTALS**

A. Submit shop drawings showing location of each item, dimensioned plans and elevations, large scale details and other components.

##### **PART 2 – PRODUCTS**

###### **2.01 MATERIALS AND FABRICATION**

A. Plastic Laminate Casework:

1. Grade: AWI Premium Grade (Sec. 400).
  2. Color, Pattern and Texture: As selected by Owner from manufacturers' standard satin-finished sheets.
    - a. P-Lam Color 1: Wilsonart, 7981K-12 Landmark Wood. Standard plastic-laminate finish for all locations.
    - b. P-Lam Color 2: Wilsonart, Wilsonart, 7943K-07 Columbian Walnut. Plastic-laminate finish for use with Courtroom, as well as furnishing Dais and Courtroom furnishing (by Owner).
  3. Face Construction: "Flush reveal overlay" type, except as otherwise indicated (drawer fronts, doors and fixed panels partially conceal casework behind).
-

4. Exposed Edges: Plastic laminate matching exposed panel surfaces, except as otherwise indicated. Ease exposed edge of overlap sheet.
5. Shelf standards let into side panels.
6. Pull-out shelves within cabinets, fabricated of matching cabinet construction, located as indicated.

B. Solid Surface Countertops:

1. Where scheduled in the drawings.
2. See SECTION 12 36 61 SOLID SURFACE FABRICATIONS shown elsewhere in these specifications.

D. Cabinet Hardware:

1. Shelf Supports: 346 Br KV shelf supports for line drilled applications, 14 hole; Knappe & Vogt Mfg. Co.
2. Side Pair Drawer Slides: 50-lb rated (per pair), ball bearing nylon wheel rollers, 1/2" wide units, extension type No. 1300; Knappe & Vogt Mfg. Co.
3. Pull Out Drawer Slides: 50-lb rated (per pair), ball bearing nylon wheel rollers, 1/2" wide units, extension type No. RS-WMUB sized per manufacturer's recommendations; Knappe & Vogt Mfg. Co.
4. Magnetic Cabinet Catches: No. DP41, aluminum; Stanley Works.
5. Pulls: 1/2" square bar, 5" long, stainless steel. No. PDDJS12HBK; Pobrico.
6. Concealed Hinges: Plated steel, sized per manufacturer's recommendations No. 71T5580; Blum.
7. Finish for Hardware: as selected by the Architect. 630 – stainless steel for all hardware.

E. Storage Room Shelving Systems:

1. Adjustable Shelf Supports: Knappe & Vogt Mfg. Co. super duty 87 SS Series 14 gauge 304-grade stainless steel standards.
2. Shelf Brackets: Knappe & Vogt Mfg. Co. super duty 186 SS/187 SS Series 14 gauge 304-grade stainless steel brackets.
3. Shelves: 3/4" MDF shelving with plastic laminate finish on all exposed surfaces.
4. Accessories: Furnish complete with rubber shelf cushions, front and center shelf rests, and suitable fasteners and anchors.

## 2.02 FABRICATION

A. Shop-fabricate casework to the greatest extent possible, disassemble only as necessary for delivery and installation.

B. Install hardware at the shop, prior to delivery. Remove hardware for finish application, and reinstall after finishing.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

A. General: Comply with standards.

B. Adjust casework and hardware so that doors and drawers operate smoothly and with tolerances as established by Standards. Lubricate operating hardware as recommended by manufacturer.

### **3.02 PROTECTION**

A. Cover casework with 4–mil polyethylene film for protection against soiling and deterioration during remainder of construction period.

**END OF SECTION**

## **DIVISION 6 – WOOD AND PLASTICS**

### **SECTION 06 60 00**

#### **CELLULAR PVC + FIBERGLASS FABRICATIONS**

##### **PART 1 – GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Cellular PVC fabrications, which includes trim, mouldings, decking, and railings.

###### **1.02 RELATED SECTIONS**

- A. Section 06 10 00 – Rough Carpentry.
- B. Section 06 20 00 – Finish Carpentry.

###### **1.03 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Minimum 5 years experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 years experience installing similar products.
- C. Mock-Ups: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

###### **1.04 SUBMITTALS**

- A. Submit shop drawings showing location of each item, dimensioned plans and elevations, large scale details and other components. Indicate attachments to resist wind loads based on ICC report testing.

###### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Comply with manufacturer's recommendations. Handle materials to avoid damage.

###### **1.06 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 recommended limits

### **1.07 WARRANTY**

A. Provide manufacturer's standard limited warranty for products, free from defects in material that occur as a direct result of the manufacturing process, occur under normal use and service, occur during the warranty period and result in blistering, peeling, flaking, cracking, splitting, cupping, rotting or structural defects from termites or fungal decay.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. AZEK Building Products, Inc. Wilmington, OH
- B. HB&G Building Products, Troy, AL
- C. Approved Substitution.

### **2.02 MATERIALS**

- A. Trim:
  - 1. Provide products complying with ASTM E 84 with a Flame Spread Index less than 25
  - 2. Material of solid cellular PVC sized to nominal dimensions fabricated by manufacturer.
    - a. PVC trim.
  - 3. Color, Pattern and Texture: As selected by Architect from manufacturers' standard satin-finished sheets. Basis of design in white.
- B. Column:
  - 1. Provide products complying with ASTM E 84 with a Flame Spread Index less than 25.
  - 2. Material of solid fiberglass to nominal dimensions fabricated by manufacturer. Moisture resistant and insect-proof with a limited lifetime warranty.
  - 3. PERMA. Bevel cap and base profile, nominal 8" post and 10" cap and base. Finish from manufacturer's standard range of colors, white.
- C. Accessories:

1. Fasteners: Stainless steel or hot-dip galvanized, with thin shank, blunt point, full round head as recommended by the manufacturer.
2. Adhesives: AZEK Adhesive, a non-toxic, odorless, UV stable, water-based PVC cement.
3. Sealants: Urethane, polyurethane or acrylic based sealants without silicone.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and conditions under which work is to be performed and identify conditions that may be detrimental to proper or timely completion.
- B. For decking and flooring installations, ensure surfaces are suitable for installation of decking and that adequate structural support has been provided.
  1. Standard Installation: Confirm that joists are spaced at 16 inches on center maximum, and are sloped at a minimum of 1/4 inch per foot away from the building.
  2. Forty-five Degree Angle Installation: Confirm that joists are spaced at 12 inches on center maximum, and are sloped at a minimum of 1/4 inch per foot away from the building.
  3. Do not proceed until unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. General: Install products in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
  1. Use manufacturer's recommended fasteners, not more than 2 inches from ends.
  2. Glue joints to eliminate joint separation.
  3. Allow for expansion and contraction at ends of the runs.
- B. Decking Installation:
  1. Install with grain side up for the walking surface.
  2. Fasten tight to joists. Provide shims if there are variations in framing.
  3. Countersink fasteners slightly to provide necessary clearance when installing the next board.
  4. Cut final boards as required for proper appearance.

### **3.03 CLEANING AND PROTECTION**

- A. Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.
- B. Clean products, prior to Substantial Completion, using materials recommended by the manufacturer to remove stains, dirt and debris prior to final acceptance.

**END OF SECTION**

# **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

## **SECTION 07 11 20**

### **AIR AND VAPOR BARRIER**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Self-adhesive, rubberized asphalt/polyethylene waterproofing membrane for air and vapor barrier applications.

##### **1.02 REFERENCES**

A. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings

B. FEMA Technical Bulletin 7: Wet Floodproofing Requirements

C. ASCE 24: Flood Resistant Design and Construction

##### **1.03 QUALITY ASSURANCE**

A. Subcontract the waterproofing work to an experienced firm who specializes in and who is acceptable to the manufacturer of the materials.

##### **1.03 SUBMITTALS**

A. Submit copies of manufacturer's specifications, installation instructions and general recommendations.

##### **1.04 JOB CONDITIONS**

A. Do not proceed with work until piping, conduit and other projections through the substrate properly patched and sealed to receive the waterproofing.

B. When ambient temperature is 40 degrees Fahrenheit or less and falling, do not proceed with waterproofing. Do not apply materials to frozen substrates or to any substrate in a condition not complying with manufacturer's recommendations.

C. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

D. Follow manufacturer's printed instructions very carefully in regard to environmental requirements, delivery, storage and handling.

## **1.05 GUARANTEE**

A. General: Contractor shall provide his written guarantee as follows, "Waterproofing is guaranteed against defects of workmanship and materials for a period of two years from date of Substantial Completion. Should leaks occur with this period, repairs to the waterproofing and repair of damage to other portions of the building caused by such leaks will be made good without cost to the Owner."

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURER**

- A. W.R. Grace & Co., Cambridge, MA 02140. "Perm-a-Barrier Wall Membrane".
- B. Approved substitution.

### **2.02 MATERIALS**

- A. Membrane: Self-adhesive, rubberized asphalt/polyethylene waterproofing membrane with vapor transmission of 0.05 perms or less; rolled with release paper to permit pressure sensitive application and self sealing of lapped joints.
- B. Primer, mastic, etc., as recommended by manufacturer.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Clean substrate of dirt, oil, loose materials and other substances which interfere with penetration, bond, or performance of damp proofing materials.

### **3.02 INSTALLATION**

- A. Cant strips, Filler: On exterior surfaces, where lower edge of damp proofing terminates at a horizontal projection (including footings under walls), provide a cant strip formed in accord with the manufacturer's details.
- B. Protect work from spillage of damp proofing materials. Replace or restore other work which is soiled or otherwise damaged by the installation of the damp proofing materials and associated work.

C. Prime substrate. Apply by brush or spray at the rate prescribed by membrane manufacturer. Allow primer to dry one hour or until tack free. Prime only the area to be covered with membrane in a working day. Re-prime if necessary.

D. Install membrane, accessory products and protection board in accord with the manufacturer's instructions and FEMA Technical Bulletin 3 guidelines. Ensure continuous coverage with no gaps or voids, overlapping seams by the recommended width.

E. Apply flood-resistant sealants around all penetrations, joints, and connections below the BFE to prevent water ingress. Follow the manufacturer's application instructions for proper adhesion and curing.

**END OF SECTION**

## **DIVISION 07 – THERMAL AND MOISTURE PROTECTION**

### **SECTION 07 18 00**

#### **DECORATIVE PEDESTRIAN TRAFFIC COATING SYSTEM**

##### **PART 1 - GENERAL**

###### **1.01 SUMMARY**

A. Section Includes:

1. Pedestrian traffic coating for second floor balcony.

###### **1.02 SUBMITTALS**

A. Product Data: Submit manufacturer's technical data sheets for each product. Provide maintenance data for products.

B. Samples: Submit 2" x 3" (minimum) samples for Owner/Architect color/texture approval.

C. Submit list of project references as documented in this section under Quality Assurance article. Include contact name and phone number of person charged with oversight of each project.

D. Quality Control Submittals: Provide protection plan of surrounding areas and non-work surfaces.

E. Manufacturer's Letter: See Quality Assurance.

###### **1.03 QUALITY ASSURANCE**

A. Qualifications:

1. Manufacturer Qualifications:
  - a. Company with minimum of 15 years experience in manufacturing of specified products and systems.
  - b. ISO 9001:2000 Certified.
2. Applicator Qualifications: Company with minimum of 5 years experience in application of specified products and systems on projects of similar size and scope, and is acceptable to product manufacturer.
  - a. Successful completion of a minimum of 5 projects of similar size and complexity to specified Work.

B. Field Sample:

1. Install at Project site or pre-selected area of building an area for field sample, as directed by Architect.
  - a. Provide mock-up 2' x 3' to include surface profile and sealant joint and allow for evaluation of slip resistance and appearance.
  - b. Apply material in accordance with manufacturer's written application instructions.
2. Manufacturer's representative shall review technical aspects, surface preparation, application, and workmanship.
3. Field sample shall be standard for judging workmanship on remainder of Project.
4. Maintain field sample during construction for workmanship comparison.
5. Do not alter, move, or destroy field sample until Work is completed and approved by Architect.
6. Obtain Architect's written approval of field sample before start of material application, including approval of aesthetics, color, texture, and appearance.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials in unopened packaging in clean, dry area protected from sunlight.

**1.05 PROJECT CONDITIONS**

- A. Environmental Requirements:
1. Do not apply when substrates are over 110 degrees F (32 degrees C) or under 40 degrees F (4 degrees C).
  2. Do not apply in rain or when rain is expected within 24 hours.

**1.06 WARRANTY**

- A. Prior to the start of work, manufacturer shall submit letter that if installed per the manufacturer requirements and these specifications that the work will qualify for the warranty listed below.
- B. The Contractor shall provide a 5-year labor and material warranty for this system at the completion of the project. The warranty shall also have language describing an

additional 5-year warranty should the Owner's re-coat with a new top layer within 5-years from the initial coating installation.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

A. Subject to compliance with requirements, provide products from the following manufacturer:

1. Master Builders Solutions by Sika Corporation  
201 Polito Avenue  
Lyndhurst, NJ 07071  
Customer Service: 800-933-7452  
Internet: usa.sika.com

B. Specifications and Drawings are based on manufacturer's proprietary literature from Sika USA Corporation. Other manufacturers shall comply with minimum levels of material, color selection, and detailing indicated in Specifications or on Drawings. Architect will be sole judge of appropriateness of substitutions.

### **2.02 MATERIALS**

A. Fluid-applied, moisture-curing, polyurethane, waterproofing, traffic-bearing, membrane deck coating system.

B. Acceptable Products:

1. Primer: MasterSeal P220. Two-component, waterborne, epoxy primer and sealer.
2. Base Coat: MasterSeal M205 low VOC Base Coat. One-component, moisture-curing polyurethane.
3. Top Coat: MasterSeal T235 low VOC Top Coat. One-component, aliphatic, moisture-curing polyurethane.
4. Aggregate: MasterSeal 941.
5. Sealant Primer: MasterSeal P176.
6. Sealant: MasterSeal NP2.
7. Deep Joint Sealant: MasterSeal SL2 or NP2.
8. Reinforcing Fabric: MasterSeal 995.
9. Clean-up: MasterSeal 990.

C. Compliances:

1. UL 790, Class A fire rating.
2. ASTM C 957.

3. ASTM E 108.
4. ASTM E 84.

D. Color:

1. As selected by Owner and approved by Engineer.

## **PART 3 - EXECUTION**

### **3.01 SURFACE PREPARATION**

A. Prepare substrates in accordance with manufacturer's instructions.

B. Mechanically prepare substrate to remove previous non-adhered coatings, laitance, and miscellaneous surface contamination. Provide surface profile to achieve specified adhesion equal to International Concrete Repair Institute surface profile CSP 3.

1. Roughen or brush blast extremely smooth surfaces to ensure good mechanical adhesion.
2. Patch holes and cracks before installation.

C. Repair voids and delaminated areas in accordance with concrete repair section of this manual. Ensure substrates are sound and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or other contaminants.

### **3.02 MIXING**

A. Mix materials in accordance with manufacturer's instructions.

### **3.03 APPLICATION – GENERAL**

A. Apply materials in accordance with manufacturer's instructions.

B. Do not apply materials to damp, wet, or contaminated substrates.

C. Surface Prestripping and Detailing:

1. Prestripe with primer 1 inch (25 mm) beyond surfaces that require detail work.
2. For nonmoving joints and cracks less than 1/16 inch (1.6 mm) wide, apply 25 wet mils (0.6 mm) prestripping of base coat over cured primer. Apply base coat to fill and overlap joint or crack 3 inches (76 mm) on each side. Feather the edges.

3. Dynamic cracks and joints over 1/16 inch (1.6 mm) wide shall be routed to a minimum of 1/4 inch by 1/4 inch (6 mm by 6 mm) and cleaned. Install bond breaker tape to prevent adhesion to bottom of joint. Prime joint faces only with sealant primer and fill with sealant. Fill joints deeper than 1/4 inch (6 mm) with backer rod and deep joint sealant. For cracks, sealant shall be flush with adjacent surface. For expansion joints, sealant shall be slightly concave.
4. Sealed joints 1 inch (25 mm) or less shall be coated over with deck coating system.
5. Expansion joints exceeding 1 inch (25 mm) wide, including primary wide expansion-joint system, shall not be coated.
6. Where coating system will be terminated and no wall, joint, or other break exists, cut 1/4 inch by 1/4 inch (6 mm by 6 mm) keyway into concrete. Fill and coat keyway as application of base coat progresses.

D. Metal Surfaces:

1. Remove dust, debris, and other contaminants from vent, drain pipe, and post penetrations; reglets; and other metal surfaces. Clean surfaces to bright metal and prime with sealant primer. Provide cant with deep joint sealant to eliminate 90-degree angles.
2. Detail cant with primer and base coat in accordance with manufacturer's instructions before application of deck coating system.

E. Priming (where required):

1. After thoroughly vacuuming surface, apply primer to properly prepared deck surfaces at rate of 200 to 250 square feet per gallon (4.9 to 6.1 m<sup>2</sup>/L). Force primer into pores and voids to eliminate pinholes. Do not apply over prestripping.
2. Allow primer to dry tack free. Apply base coat same working day.
3. Sika Representative to indicate if primer is required in any areas as part of surface preparation review.

### **3.04 LIGHT- TO MEDIUM-DUTY TRAFFIC AND PEDESTRIAN SYSTEM**

A. Base Coat: Apply 25 wet mils (0.6 mm) of base coat. Immediately backroll to level base coat. Allow to cure overnight.

B. Top Coat: Apply 25 wet mils (0.6 mm) of top coat. Immediately backroll to level top coat.

C. While coating is still wet, broadcast aggregate at rate of 10 to 15 pounds per 100 square feet (0.5 to 0.7 kg/m<sup>2</sup>). Backroll into coating to fully encapsulate.

### **3.05 PROTECTION**

- A. Pedestrian Traffic: Allow minimum curing time of 48 hours before pedestrian use.
- B. Extend curing time in cool-weather conditions.
- C. Protect system from damage during construction.
- D. After coating has cured, apply joint sealant around perimeter of guardrail post bases. Sealant color to match coating color.

**END OF SECTION**

## **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

### **SECTION 07 19 00**

#### **WATER REPELLENT SEALER**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Application of a clear water based penetrating sealer to new masonry, pre-cast or concrete foundation walls.

###### **1.02 SUBMITTALS**

A. Manufacturers specifications and application instructions.

###### **1.03 QUALITY ASSURANCE**

A. Coating must be applied by an applicator approved by the manufacturer.

###### **1.04 WARRANTY**

A. Furnish manufacturer's limited warranty to provide sufficient material to restore the water repellence lost by failure of the installed product within a three-year period.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

A. Deco Products, Inc., Denver, Colorado 80207

B. Approved substitution.

###### **2.02 MATERIAL**

A. Deco 20 Penetrating Concrete Sealer, water based, fluid-applied one-coat liquid silicate coating for use as a dampproofing membrane.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Repair all structural deficiencies before application.
- B. Cover all areas or surfaces not to be sealed.
- C. Concrete tie locations below grade that create holes or recesses into the wall, shall be sealed with an approved material or method.

### **3.02 APPLICATION**

- A. Apply per manufacturer's recommendation.

**END OF SECTION**

# **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

## **SECTION 07 21 13.13**

### **PERIMETER INSULATION**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Insulation for perimeter areas of on-grade floor slabs.

##### **1.02 QUALITY ASSURANCE**

A. ASTM C578: Specification for Pre-Formed, Cellular, Polystyrene Thermal Insulation.

B. Standards:

1. R Value: 50°F. ft<sup>2</sup>.h/BTU per inch, min. at 75°F. mean temperature (ASTM C518) and warranted to retain at least 90% of its original R value for 15 years.

##### **1.03 SUBMITTALS**

A. Catalog data for review.

##### **1.04 WARRANTY**

A. 15-year period. Include printed warranty certificate.

##### **1.05 PRODUCT HANDLING, STORAGE**

A. Comply with the manufacturer's instructions. Do not expose to flame or other ignition sources.

B. Protect insulation from exposure to sunlight.

#### **PART 2 - PRODUCTS**

##### **2.01 MANUFACTURER**

A. Dow Chemical, Midland, Mich. 48674.

1. Styrofoam brand square edge or score board insulation.
- B. Approved substitution.

## **2.02 MATERIALS**

- A. Insulation: Closed cell extruded polystyrene board. ASTM C578, Type IV. Compressive strength 25 lb/in.<sup>2</sup> minimum (ASTM D1621). Water absorption 0.1% by volume maximum (ASTM C272).
- B. Mastic: Type as recommended by insulation manufacturer.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Set units with tight joints, against inside face of foundation wall with 1/4" to 3/8" continuous beads spaced 16" O.C. or 1-1/2" diameter 1-1/2" high spots in rows 8" apart and spaced 16" on center.
- B. Apply insulation to wall within 15 minutes after adhesive is applied.

**END OF SECTION**

# **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

## **SECTION 07 21 16**

### **BATT INSULATION**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Batt and roll-type insulation placed between studs in walls and in attics.

##### **1.02 QUALITY ASSURANCE**

- A. ASTM C665: Insulation Blankets, Thermal (Mineral Fiber).

##### **1.03 SUBMITTALS**

- A. Catalog data for review.

#### **PART 2 - PRODUCTS**

##### **2.01 MANUFACTURER**

- A. Owens Corning, Toledo, OH 43659.
- B. Approved substitution.

##### **2.02 MATERIALS**

- A. Glass fiber building insulation blankets with Kraft paper vapor retarder one face with stapling flange. ASTM C665, Type II, Class C.
- B. Un-faced glass fiber building insulation blankets for exposed application in attic areas. ASTM C665, Type I.
  - 1. Consult and comply with manufacturer's recommendations for using vapor barrier facings for attic applications based on climate zone and other factors.
- C. Un-faced glass fiber insulation blankets for sound batt insulation. ASTM C665, Type I.

D. Attic stair insulator tent comprised of fiberglass insulation R-10 insulation value. Size shall be selected from manufacturer's standard sizes to cover attic access openings.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION**

A. Install insulation in accord with the manufacturer's recommendations for the particular type of insulation.

B. Install attic stair insulator tent over attic access panels as recommended by the manufacturer.

**END OF SECTION**

# DIVISION 7 - THERMAL AND MOISTURE PROTECTION

## SECTION 07 46 00

### FIBER-CEMENT SIDING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Fiber-cement siding panels and related work shown on drawings.
- B. Fiber-cement battens and trim.

##### 1.02 SUBMITTALS

- A. Catalogue data of materials for review.
- B. Samples of specified profile and complete color line for selection.
- C. Load tables indicating fastening pattern suitable for allowable wind loads of +/- 46psf.
- D. Sample wall:
  - 1. One (1) fibercement sheet siding panel with battens and contrasting fibercement trim along top and bottom of siding. Assembled panel shall be approximately 4 foot wide by 4 foot high. Siding and trim colors as selected by the architect from the manufacturer's standard finishes.
  - 2. Approved panel will remain as sample until fibercement siding work is completed, and will serve, after review, as the standard for such work.

##### 1.03 GUARANTEE

- A. Furnish certified copy of manufacturer's limited lifetime warranty.

#### PART 2 - PRODUCTS

##### 2.01 MANUFACTURER

- A. James Hardie Siding Products, Mission Viejo, CA 92691.
- B. Approved substitution.

## **2.02 SIDING**

A. Portland cement/ground sand/cellulose fiber composition exterior lap siding complying with ASTM C1186, Grade II, Type A, non-asbestos fiber-cement plank. Factory primed for field painting. 6-1/4" x 5/16" x 12 foot lengths. Lap Siding + Vertical Siding in manufacturer's standard colors. Lap siding in Boothbay Blue, Board + Batten in Light Mist, Trim in Arctic White. Exterior siding to be painted, see section 09910 – PAINTS.

B. Surface Burning Characteristics in accordance with ASTM E-84: Flame Spread 0, Fuel Contribution, Smoke Developed 5.

## **2.03 ACCESSORIES**

A. Use manufacturer's recommended accessories, moldings and corrosion resistant fasteners for a complete application.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

A. Prior to commencing work, verify governing dimensions of building. Examine, clean and repair, if necessary, any adjoining work on which this work is in any way dependent for its proper installation.

### **3.02 INSTALLATION**

A. The field application of the siding and trim members shall be in accordance with the best practice, with all joint members true and plumb.

B. Fiber-cement siding and accessories shall be installed in accordance with the latest editions of manufacturer's installation manuals.

**END OF SECTION**

## **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

### **SECTION 07 54 19**

#### **POLYVINYL CHLORIDE ROOFING**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Polyvinyl chloride roofing membrane applied over indicated roof surfaces.
- B. Coordinate roofing operations with sheet metal work so that flashings can be installed to permit continuous roof surfacing operations.
- C. Coordinate roofing operations with roof insulation work so that insulation applied each day is weatherproofed the same day with the completed membrane.

###### **1.02 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM D4434 Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.
  - 2. ASTM D6754 Standard Specification for Ketone Ethylene Ester Based Sheet Roofing.
- B. UL 580: Uplift Resistance of Roof Assemblies.

###### **1.03 QUALITY ASSURANCE**

- A. Listed by UL for Class A service.
- B. The roofing membrane shall comply with ASTM D4434 or ASTM D6754.
- C. Roofing and flashing shall be applied by a factory trained and approved roofing contractor. Furnish evidence of manufacturer's current approval or certification before starting installation.
- D. Furnish evidence of membranes manufacturer's approval of roof insulation.

###### **1.04 SUBMITTALS**

- A. Manufacturer's data for installation of the membrane, including procedures for preparing the membrane for use, flashing and splicing.
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B. Evidence of conformance to fire rating and wind uplift resistance requirements of this specification and of UL 580.

C. Samples:

1. Membrane: 1 piece 12x12 inches.

## **1.05 PRODUCT DELIVERY AND STORAGE**

A. Deliver materials to job site in the manufacturer's original, unopened packages, clearly marked with the manufacturer's name, brand name, and description of contents. Store membrane flashing and adhesives in clean dry areas. Storage temperature for adhesives shall be between 60 degrees Fahrenheit and 80 degrees Fahrenheit.

## **1.06 WARRANTY**

A. Furnish to the Owner, the Manufacturer's standard 20-year total system warranty of water-tightness. This warranty shall be fully paid for by the Roofing Contractor.

B. This warranty shall cover both labor and materials necessary to ensure water-tightness, including that required to repair roof leaks caused by structural movement or standing water on the roof membrane.

C. Follow manufacturer's warranty revisions & alterations procedures for any revision to the roof structure, installation of photovoltaics, or inclusion of utilities beyond initial installation of roofing membrane.

## **1.07 PRE-ROOF CONFERENCE**

A. Hold a pre-roofing conference to review the installation of roof. Conference should occur after all of the required shop drawings, submittals, and sample have been approved.

B. Conference should address installation procedures, termination of roofing, sequencing of work with other trades at and below roof with consideration to schedule impact, water tightness, provision of temporary protection, safety procedures, and other safety procedures.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Versico Roofing System, Carlisle, PA 17013.

B. Approved substitution.

## **2.02 MATERIALS**

A. Roofing Membrane: VersiFlex 60-mil thick Polyester Reinforced PVC Membrane enhanced by a polyester fabric that is encapsulated between the PVC based top and bottom plies, with surface-applied VersiFlex PVC rib profile.

1. Color: White.
2. Thickness over scrim: 0.028 inches.
3. Weight: 0.40 lbs/square foot.
4. Water vapor permeance: 0.10 perms maximum.

B. Adhesives: Splicing cements, caulks, primers, sealants and bonding adhesives or types recommended or provided by the roofing membrane manufacturer.

C. Nails and Fasteners: Types and sizes suited for the purpose and complying with roofing manufacturer's instructions.

D. Flashings: Metal flashings, gutters and downspouts fabricated of material equal to Torcal metal of sufficient gauge and finish to accommodate it's intended use and complying with roofing manufacturer's instructions.

E. Water Cut-off: Contractor must provide water cut-off when and where the danger exists that water may get under the new roofing membrane. Make cut-offs by extending membrane beyond insulation and securely setting edge in 6" of plastic roofing cement. Comply with manufacturer's instructions.

F. Slip Sheet: Non-asphaltic slip sheet of material and manufacturer APPROVED BY ROOFING MEMBRANE MANUFACTURER.

G. Fastening: Bar or disc anchor, forming a system as developed by membrane manufacturer.

H. Flashings: VersiFlex Non-Reinforced Flashing, Reinforced Cover Strips, Pre-Molded Inside/Outside Corners, Pipe Flashings, LIQUISEAL Liquid Flashing and Sealant Pockets for use as directed by manufacturer to create a watertight roof assembly.

I. Expansion Joints: VersiGard Expansion Joint Supports made of high-quality extruded EPDM and compatible with VersiFlex PVC. Joints shall allow for rubber-to-membrane contact and flexibility at joints.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. Insulation over which roofing is installed shall conform to SECTION: ROOF INSULATION. Surfaces on or against which membrane is applied shall be smooth, free of standing water, swept clean, and free from oil, grease, sharp edges and construction debris. Seal joints over ¼" wide.

B. Nailers must be in place.

### **3.02 INSTALLATION**

A. Install in accord with the manufacturer's approved instructions for fully adhered roofing membrane.

B. Flashing: Flash edges of membrane, projections through the roof and changes in roof planes. Complete splice between flashing and membrane before bonding the flashing to vertical surfaces. The splice shall be sealed a minimum of 3 inches on each side of the fasteners which attach the membrane to nailers. The installed flashing shall be nailed at the top of the flashing a maximum of 12 inches on center under metal counter-flashing or cap.

C. Membrane: fully adhere in place prior to sealing side laps. Splice to adjoining sheets using minimum 2 inch wide laps. Direction of lap such that water flows over lap. Membrane joints shall be free of wrinkles or fishmouths. Mating surfaces of joints shall be cleaned. Remove excess adhesive on splice edges with solvent and make joints watertight. Secure membrane at roof perimeter and penetrations. Joints shall be inspected over entire length after completion and defective areas resealed. Damaged areas of membrane shall be removed and recovered, lapping underlying membrane by at least 3 inches on all sides.

1. Install anchor bars and cover strips in accord with the manufacturer's directions.

D. Cut-offs: Install if work is ended before weatherproofing roof. Align leading edge of insulation using loose laid cut sheets and seal membrane to roof deck. Membrane shall be pulled free or cut to expose the insulation when resuming work.

E. Expansion joints: Expansion Joint filler must be installed prior to installation of Expansion Joint Support to help eliminate internal pressure and condensation. When using reinforced membrane, allow extra membrane over Expansion Joints for movement of building. Membrane flashing shall NOT be adhered over the Expansion Joint Support.

1. Reference VersiFlex detail TPC-3.1 Deck-to-Deck Expansion Detail or TPC-3.2 Deck-to-Wall Expansion Detail. Approximately 1/8" (3 mm) diameter bead of Cut-Edge Sealant is required on cut edges of of PVC membranes.

### **3.03 TESTING**

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A. Test for leaks immediately after nominal cure of the materials. Repair leaks, if any, and retest until roof is watertight.

### **3.04 REVISIONS AND ALTERATION PROCEDURES**

A. Follow manufacturer's procedures—warranty revisions and alterations procedures—for modifications to the roof membrane to maintain total system warranty and weather tightness of roof.

B. For any modifications to the roof structure, inclusion of photovoltaics, wind turbines, roof gardens, or any utility placed upon or attached to the roof.

C. Solar panel installations entail additional documentation for manufacturer.

D. An authorized roofing contractor must perform all revision work, and is recommended that that the original roofing contractor perform work and revisions.

E. The authorized roofing contractor must notify the manufacturer when the revision work is complete for inspection, and follow manufacturer's inspection procedure for warranty continuation.

**END OF SECTION**

# **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

## **SECTION 07 61 00**

### **SHEET METAL ROOFING**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. A pre-engineered, pre-formed structural coated aluminum standing seam roof system and structural metal deck installed over structural framing members.
- B. Gutters, downspouts, fascia members, valleys, flashings and accessory items.
- C. Perforated (vented) metal soffit system.

##### **1.02 SUBMITTALS**

- A. Two sample sections of each roofing assembly type 12" long of roofing panels with gutter showing method of seaming and attachment.
- B. Color samples for selection.
- C. Shop drawings indicating thicknesses, dimensions, layouts, fastenings and anchoring methods, expansion joints, and other provisions necessary to provide for thermal expansion and contraction.
- D. Submit engineering calculations, prepared and certified by a civil or structural engineer, registered in the State of Delaware. Include structural members, fasteners and anchorage components for a roof framing system. Roofing system shall meet the intent of systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7. See drawings for roof components and cladding loading. If loads calculated by roofing engineer are different, the more stringent shall apply. Include calculations for edge metal meeting Factory Mutual ES-1 requirements.
- E. Review of calculations and shop drawings by the Architect will not relieve the Contractor of responsibility for providing a system to meet performance requirements.
- F. Submit calculations with first submittal of shop drawings.
- G. Do not change shop drawings and date bearing Architect's final review stamp or

deviate from construction details unless changes are submitted to the Architect for review.

H. Begin fabrication only after receiving shop drawings and engineering calculations bearing Architect's final review stamp.

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

A. Materials shall be adequately packaged and protected during shipment and shall be inspected for damage, dampness, and wet-storage stains upon delivery to the job site. Damaged or permanently stained materials that cannot be restored to like-new condition shall be removed from the site and replaced.

B. Carefully handle sheet metal items to avoid damage to surfaces, edges, and ends.

C. Store material in dry, weather-tight, ventilated areas until immediately before installation.

### **1.04 QUALITY ASSURANCE**

A. The metal roofing installation shall be inspected on a full-time basis by a qualified representative of the roofing manufacturer. Furnish daily inspection reports and a final approval report, certifying the metal roofing system has been installed in strict accordance with the roofing manufacturer's requirements.

### **1.05 WARRANTY**

A. Weathertight warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 Years from date of Substantial Completion
2. The installed shall extend a two (2) year weather tightness warranty.

B. Finish warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace standing seam metal roof panels that show evidence of deterioration of factory-applied finish within specified warranty period.

1. Exposed Panels Finish - deterioration includes the following:
  - a. Color fading more than 5 hunter units when tested according to ASTM D 2244
  - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214
  - c. Cracking, checking, peeling or failure of a paint to adhere to a bare

metal.

2. Warranty Period: 20 Years from the date of substantial completion

C. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight condition.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Peterson Aluminum Corporation, Annapolis Junction, MD 20701.

1. Roof Panels: Snap-Clad. Utilize Tite-Loc Plus for locations of metal panel roof where slope is less than 2:12.
2. Sallyport/EMS Bay Soffit Panels: Soffit Reveal, unvented.
3. Eave Soffit Panels: PAC-750 Soffit Vented

B. Approved substitution.

### **2.02 MATERIALS**

A. Standing Seam Roofing System: Sandwich assembly consisting of top layer structural standing seam roof panel over waterproof membrane underlayment on plywood deck.

1. Provide accessories such as clips, back-up plates, hip pans, valley trim, ridge cap, eave trim and other items for a complete installation of same materials as items to which they are applied.
2. Exposed exterior sheet metal items hot dipped aluminum, smooth surface, shall have a factory-applied fluoropolymer Kynar 500 coating after metal substrate has been properly cleaned and pretreated. Coating 1.0 mil film thickness, consisting of primer and minimum .75 dry film color coat. Roof panels .032" aluminum.
3. System consists of clip anchored metal pan 16" wide by 1.75" high with upturned leg on one side which locks over a hold-down clip and the next adjoining panel leg. Strippable protective coating.
  - a. Clips: Per structural calculations at spacings indicated.
  - b. Substrate: As detailed.
4. Finish color based on manufacturer's standard range of colors. Final color to be determined by Owner, basis of design PAC Clad's standard range Cityscape.

B. Ridge Cap: Manufacturers standard type. Vented type where indicated

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C. Gutters: Furnish and install in size and shape indicated. Provide with roof apron. Joints should be lapped, riveted and sealed. Provide with expansion joints, outlet tubes and end caps. Gutter straps spaced 32" O.C. Hang gutters level. Manufacturer is responsible for design of gutter size based on published rainfall intensity projections by U.S. Weather Bureau. Minimum size 6" x 6".

D. Outlet Tubes: Size as required to fit downspouts. Refer to SMACNA Plate 24, Fig. C rectangular shape and Plate 33, Detail 1.

E. Expansion Joints: Refer to SMACNA Plate 8. Gutter ends are flanged at the top, riveted and sealed into each section of gutter. Sections are joined and a cap is used to cover the joint. Leave one inch space between end caps. Provide cover plate to cover expansion joint. Maximum length of gutter between expansion joints 60 feet.

F. Downspouts: Rectangular style, SMACNA Plate 32, Figure B. Form in 8 to 10 foot lengths with telescoping end joints and locked longitudinal joints. Fasten to wall with hangers similar to SMACNA Figure C, Plate 35. Hangers spaced max. 5'-0" on center. Provide with offset elbows at top and elbow at bottom for discharge onto splash blocks.

G. Flashings, including valley and step flashings, trims, gutters, downspouts, and accessories, factory formed coated steel in finish and selected color to match panels with strippable protective coating.

H. Sealants and Closures: Type formulated for use with specified roofing systems.

1. Sealants: Closed cell rubber and butyl tape mastic.
2. Sealant: Acrylic gun grade.
3. Closures: Same material and finish as roof panels.

K. Fasteners: Non-corrosive screws and rivets, color coated where exposed, of size and type required for the particular application. Provide screws with self sealing washers where required.

L. Perforated Metal Soffit System: 12" wide baked enamel, .032" aluminum. Hook, pull and fasten interlock system, by metal roofing manufacturer. Color to match roofing panel.

M. Underlayment: High temperature self-adhesive 40 mil thick roofing underlayment composed of rubberized asphalt adhesive backed by a layer of high performance polymeric film. High temperature underlayment shall be installed on all roof sheathing.

1. Grace Ice & Watershield HT.
2. Approved substitution.

N. Snow Guard System: Pre-manufactured snow rail system comprised of mill finished aluminum clips and cross members attached to metal roof panel seams, designed to hold a slide-in continuous color strip fabricated of metal roof panel material of matching color and finish.

1. S-5 ColorGard System.
2. Approved substitution.

## **2.03 FABRICATION**

A. Ensure that finish on panels is hard and dry before passing coils through forming rollers. Surface defects will be cause for rejection of panels.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. General: Surfaces to receive structural framing members and sheet metal roofing must be plumb and true, clean, even, smooth, dry and free from defects and projections which might affect the application.

### **3.02 INSTALLATION**

A. Install materials in accord with manufacturer's instructions and approved shop drawings. Allow for expansion and contraction.

B. Install panels so that they are weather-tight, without waves, warps, and buckles, fastening stresses or distortion.

C. Panel Anchorage: Space clips as directed by manufacturer. Screw-attach clips to framing members or metal sub-deck as detailed.

D. The upper and lower edge of roof sheets shall be flashed and closed off in accord with manufacturer's installation details. Apply sealants where necessary at flashing details to achieve a weather-tight system.

E. Surfaces in contact with mortar, concrete, or other masonry materials or dissimilar metals shall be painted with coating such as heavy-bodied bituminous paint.

### **3.03 CLEANING**

A. Clean exposed sheet metal work at completion of installation. Grease and oil films, handling marks, filing and drilling debris and strippable films shall be removed,

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and the work cleaned. Exposed metal surfaces shall be free of dents, creases, waves, scratch marks, and weld marks.

### **3.04 REPAIRS TO FINISH**

A. Scratches, abrasions, and minor surface defects may be repaired in accord with manufacturer's printed instructions and as approved. Repaired surfaces shall be uniform and free from scratches, blemishes, and from variations of color and surface texture.

### **3.05 TESTING**

A. Hose test for leaks. Repair leaks, if any and retest until roof is watertight.

**END OF SECTION**

# DIVISION 7 - THERMAL AND MOISTURE PROTECTION

## SECTION 07 62 00

### SHEET METAL FLASHING AND TRIM

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Sheet metal flashings and sheet metal required to prevent penetration of water through exterior shell of building not specified elsewhere.
- B. Related Work Specified Elsewhere
  - 1. Sealants and Caulking: Section 07 92 00.

##### C. REFERENCES

- 1. FEMA Technical Bulletin 2: Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas
- 2. FEMA Technical Bulletin 8: Corrosion Protection for Metal Connectors and Fasteners in Coastal Areas
- 3. ASCE 24: Flood Resistant Design and Construction

##### 1.02 QUALITY ASSURANCE

- A. Comply with applicable provisions of the latest editions of:
  - 1. SMACNA: Architectural Sheet Metal Manual.
- B. Applicator Qualifications:
  - 1. Use competent workmen.
  - 2. Roofer must have in his possession a copy of the SMACNA manual, latest edition.

##### 1.03 SUBMITTALS

- A. Two samples of sheet metal of each gauge specified, each 6 x 12 inches.
- B. General: Submit comparative color samples for exposed items for selection and

approval.

#### **1.04 GUARANTEE**

A. General Contractor shall provide his written guarantee as follows:

"Flashing and sheet metal are guaranteed against leaks, defects of workmanship and materials, and defects developing under natural wear and tear for a period of two years from date of Substantial Completion. Should leaks occur within this period, repairs to flashing and sheet metal and damage to other portions of building caused by such leaks will be made good without cost to the Owner."

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

A. Aluminum sheet metal flashing: ASTM B209, 6063-T5 alloy, mill finish, shop pre-coated, 0.032" thick (minimum) except as otherwise indicated.

B. Fastenings: Of size and type required for a secure installation.

1. Screws, Rivets, Bolts: Use aluminum only with aluminum metal roofing.
2. Nails: Large head, use aluminum only with aluminum metal roofing.

C. Elastic Sealant: Type formulated for use with aluminum.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

A. General: Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry and free from defects which might affect the application. Provide installation in accord with the applicable requirements of SMACNA.

B. Separate dissimilar metals and separate metals from contact with other corrosive materials with a 15-mil coating of bituminous mastic.

C. Prepare all metal surfaces to be coated or galvanized by removing rust, scale, and contaminants using appropriate methods such as abrasive blasting or chemical cleaning.

### **3.02 WORKMANSHIP**

#### **A. General:**

1. Form sheet metal accurately with true, sharp, and straight lines to an accurate fit.
2. Unless otherwise noted, turn exposed edges back 1/2 inch.

**B. Expansion:** Form, fabricate, and install sheet metal to provide for expansion and contraction.

**C. Joints:** Join parts with rivets where necessary for strength or stiffness. Seal joints.

#### **D. Nailing:**

1. Whenever possible, secure metal by means of clips or cleats without nailing through metal.
2. In General: Space nails, rivets, and screws as recommended by SMACNA.
3. Into Wood: Use barbed roofing nails.

**E. Aluminum 0.040 inch or less in thickness** butted with space and backed with formed flashing plate, or lock joined, mechanically fastened, and joint filled with sealant.

### **3.03 EMBEDMENT**

**A. Solid bed of sealant,** using methods described by the manufacturer.

### **3.04 ITEMS**

**A. Where flashings are built into concrete/masonry,** set flashing with a bed of mortar above and below the flashing.

### **3.05 TEST**

**A. By hose or standing water** that flashing and sheet metal is watertight.

**B. Repair or replace defective materials.** Re-test.

**END OF SECTION**

# DIVISION 7 – THERMAL AND MOISTURE PROTECTION

## SECTION 07 27 13

### FLEXIBLE WALL FLASHING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

A. Self-adhesive, rubberized asphalt/polyethylene flashing tapes for windows, doors, wall penetrations, and cavity wall applications.

##### 1.02 SUBMITTALS

A. Manufacturer's catalog data for review.

#### PART 2 - PRODUCTS

##### 2.01 MANUFACTURER

A. GCP Applied Technologies, Inc., Cambridge, MA 02140.

B. Approved substitution.

##### 2.02 MATERIALS

A. Flashing: Perm-a-Barrier Wall Flashing. 40 mil total thickness self-adhesive, cold applied tape consisting of 32 mils of rubberized asphalt integrally bonded to an 8 mil high density, cross laminated polyethylene film.

B. Primer, adhesives, etc.: As recommended by membrane manufacturer.

#### PART 3 - EXECUTION

##### 3.01 INSTALLATION

A. Form and install in accord with the manufacturer's instructions for the specific application.

B. Surface to receive flashing must be reasonably smooth and free from irregularities. On horizontal surfaces lay flashing either in a fresh bed of mortar above and below or a trowel coat of mastic. Spot vertical surfaces with asphalt mastic to hold flashing in place.

**END OF SECTION**

## **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

### **SECTION 07 72 00**

#### **ROOFTOP FALL PROTECTION AND ACCESSORIES**

##### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Aluminum Safety Railings.(KEE LITE)
- B. Rooftop hatch safety railing systems. (KEE HATCH)
- C. Rooftop walkway systems. (KEE WALK)
- D. Single rigid anchors fall protection systems. (KEE POST)

##### **1.2 RELATED SECTIONS**

- A. Section 05 50 00 - Metal Fabrications.
- B. Section 07 72 33 – Roof Scuttle

##### **1.3 REFERENCES**

- A. ASTM International (ASTM):
  - 1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A123 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 3. ASTM A500 - Standard Specification for cold-formed welded and seamless carbon steel structural tubing.
  - 4. ASTM B221 - Standard Specification for Aluminum and Aluminum Alloy extruded bars, rods, wires, profiles, and tubes.
- B. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 1910.29 - Fall Protection systems and falling object protection.
  - 2. OSHA 1926.502 - Fall Protection systems criteria and practices.
- C. Underwriters Laboratories (UL): UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

##### **1.4 SUBMITTALS**

- A. Submit under provisions of Section 01 30 00 - Submittals.
- 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: Including but not limited to indication of profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation of handrails and guardrails including but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.
- D. Selection Samples: For each system specified, two complete sets of color chips representing manufacturer's full range of available finishes.
- E. Verification Samples: For each system specified, two samples, minimum size 6 inches (150 mm) long, representing actual system components and finishes.

## 1.5 QUALITY ASSURANCE

- A. Railings Structural Requirements:
1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 lbs (90,719 g) applied horizontally or vertically down at any point on the top rail.
  2. Handrail assemblies and guards shall be designed to resist a load of 50 lbs per linear ft (0.73 kN per m) applied in any direction at the top and to transfer this load through the supports to the structure.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, Store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer.
1. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.
  2. Store products in manufacturer's unopened packaging until ready for installation.
  3. Protect finishes from damage.

## 1.7 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.

- B. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
  - 1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication, delivery, and installation.
- C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Kee Safety, Inc., Buffalo, NY 14206
- B. Approved Substitutions

### **2.2 SAFETY RAILINGS PERFORMANCE AND DESIGN REQUIREMENTS**

- A. Performance and Design Requirements: Pipe and tube railing and guardrail design.
  - 1. Comply with the following:
    - a. International Building Code/International Code Council.
    - b. OSHA Standard Pipe Railing: 1910.29 Fall Protection systems and falling object protection.
    - c. Local code requirements by authorities having jurisdiction.
  - 2. Delegated Design: Railing design is to be the responsibility of a professional engineer, licensed in the same location as the project. See Section 01 40 00 - Quality Control
  - 3. Structural Performance: Railings and Attachments: Withstand effects of gravity loads and the following loads as specified.
    - a. Recommended Maximum Post Spacing: 72 inches (1829 mm).
    - b. Minimum Height: 42 inches (1067 mm).
    - c. Intermediate Rail Height: 21 inches (533 mm).
    - d. Toe Board:
      - 1) Height: 4 inches (102 mm). 1/4 inch (6 mm) or less above the floor.
      - 2) Required wherever, beneath open sides, persons can pass, there is moving machinery, or there is equipment with which falling materials could create a hazard.
    - e. Handrails and Top Rail of Railing Systems:
      - 1) Uniform Load: 50 lbf per ft. (0.73 kN per m) in any direction.
      - 2) Concentrated Load: 200 lbf (0.89 kN) in any direction.
      - 3) Uniform and concentrated loads need not be assumed to act

concurrently.

4. Allow expansion and contraction due to thermal movements caused by temperature changes.

### 2.3 ALUMINUM SAFETY RAILINGS COMPONENTS - KEE LITE

- A. Basis of Design: KEE LITE Components and Pipe as manufactured by Kee Safety. Slip-on components to create versatile and rigid tubular system structures. The product line is to provide the versatility needed to achieve any structure configuration.
  1. Handrails and guardrails.
  2. Roof hatch guardrails.
  3. Safety barriers.
- B. Performance and Design Requirements: Safety Railing Components: KEE LITE.
  1. Fittings: High grade Aluminum Silicon Magnesium Alloy Fittings or Castings conforming to ASTM A356 T-6.
  2. Fittings Range: Eight different pipe sizes from 3/4 to 2 inches (19 to 51 mm).
  3. Hexagon Set Screws; Firmly lock components to pipes.
  4. Fittings Sizes 5 to 9:
    - a. Axial Load: Supports 2000 lbs (907 kg). per set screw tightened to 29 ft-lbs (39.3 N-m) torque.
      - 1) Safety factor of 2:1.
      - 2) Required Torque: Normally obtained when set screws are tightened using a ratchet wrench.
- C. Components: KEE LITE.
  1. Fittings, Brackets, Flanges, and Anchors: Cast or formed metal of same material and finish as supported rails. Surfaces: Smooth. No seams, marks, trade names, or discolorations.
  2. Fittings by Function:
    - a. Bases, Couplings, Crosses, Crossovers, Elbows, Flanges, Handrail Wall Bracket, Plugs, Swivel Sockets, Tees and Sockets, Toe Board Kits, Miscellaneous.
- D. Material for Posts and Railings: KEE LITE.
  1. Aluminum Pipe: Alloy 6061-T6 conforming to ASTM B221.
    - a. Nominal Mill Length: 24 ft (7.315 m).
    - b. Pipe: Schedule 80 ASTM B221.
    - c. Finish: From standard range of color as determined by Owner and Architect, Anodized Clear.
    - d. Nom. Pipe Size: 3/4 inch (19 mm). Outside Dia: 1.050 inches (26.67 mm).
      - 1) KEE Component Size: 5.
    - e. Nom. Pipe Size: 1 inch (25 mm). Outside Dia: 1.315 inches (33.40 mm).

- 1) KEE Component Size: 6.
- f. Nom. Pipe Size: 1-1/4 inch (32 mm). Outside Dia: 1.660 inches (42.26 mm).
  - 1) KEE Component Size: 7.
- g. Nom. Pipe Size: 1-1/2 inch (38 mm). Outside Dia: 1.900 inches (48.26 mm).
  - 1) KEE Component Size: 8.
- h. Nom. Pipe Size: 2 inch (51 mm). Outside Dia: 2.375 inches (60.32 mm).
  - 1) KEE Component Size: 9.

## 2.4 ROOFTOP HATCH SAFETY RAILING SYSTEMS (KEE HATCH)

- A. Basis of Design: KEE HATCH as manufactured by Kee Safety Inc.
  - 1. Description: Safety railing system designed for safe egress/ingress through roof access hatches and protection while hatch open; integrates with existing openings and ladderways.
  - 2. Components include but are not limited to gate subassemblies, tubing, fittings, and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.
  - 3. Compliance:
    - a. ANSI A21.1 - Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
    - b. ANSI A14.3 - 2008 Ladders-fixed-safety requirement.
    - c. ANSI A1264.1-2007 Safety requirement for workplace walking / working surfaces and their access.
    - d. ANSI A58.1 - Minimum Design Loads in Buildings and Other Structures.
    - e. OSHA Standard 29 CFR 1910.29.
    - f. OSHA Standard 29 CFR 1910.28.
    - g. OSHA Standard 29 CFR 1926.501.
    - h. OSHA Standard 29 CFR 1926.502.
    - i. Canadian National Building Code 4.1.5.14
    - j. HSG-33 Health and Safety in Roof Work.
    - k. HSE Specialist Report No 15.
    - l. HSE Sheet 21 "Working on Flat Roofs Protection Against Falls."
    - m. EU Directives and CDM Regulations.
    - n. International building code 2018.
    - o. BGV A1: 2000, BGG 928 and BGR 184.
    - p. Health, Safety and Welfare Regulation 13 "Falls or Falling Objects."
    - q. EN 13374 Class A.
    - r. TUV Tested.
    - s. Lifecycle testing - BC 6375-2:2009 Clause 6.5 - Opening and closing of Gate through 90 degrees.
    - t. Salt Spray Testing - ASTM B117-11-55 over 200 hours to assess performance of coating to resist corrosion.

4. Modular and adjustable on System Configuration: Type RHSR-SS-3630 - Standard System; for roof hatches 30 inches (762 mm) by 36 inches (914 mm) with hatchway ladder mounted on 30-inch (762 mm) side of hatch opposite of hatch lid hinge.
5. Toe boards: No drilling required; upright hardware and splice kits for corners and straight sections as required for complete installation.
6. Safety Gates: Included.
7. Nominal Pipe Size: 1-1/4 inch (32 mm).
8. Steel Pipe: ASTM A53.
9. Fittings: Galvanized cast iron, ASTM A47 with ASTM A123 galvanizing.
10. Powder coating - from a wide range of RAL colors as specified by Architect
11. Components: As scheduled and indicated on Drawings, as required to match design indicated on Drawings and as required to provide complete installation.

## 2.5 ROOFTOP WALKWAY SYSTEMS (KEE WALK)

- A. Basis of Design: KEE WALK as manufactured by Kee Safety Inc.
  1. Description: Modular walkway system to provide anti-slip, level surface for demarcated route on roof, uniformly distributes pedestrian load; designed for roof types including metal profile standing seam, and membrane. KeeWalk can accommodate flat, barrel, and pitched roofs and is also field-adjustable for sloping roofs up to 35 degrees.
  2. Provide components including but not limited to clips, brackets, walkway modules and accessories with appropriate fasteners as indicated or required to match design indicated on Drawings and to provide complete installation.
  3. Compliance:
    - a. Fire rated to class HB of UL 94 (harmonized with ISO 9772).
    - b. Slip Resistance:
      - 1) OSHA Standard 29 CFR 1910.22.
      - 2) British Standard BS 4592.
  4. Bearer Bars: Aluminum.
  5. Treads: Fiberglass reinforced nylon; open tread design to allow water drainage.
    - a. UV Resistant and fire rates to Class HB of UL94.
    - b. Sections: 59 or 118 inches (1.5 or 3 m).
  6. System Configuration: As indicated on Drawings.
  7. System Configuration: Traverse; level walking surface mounted onto sub-frame fixed to roof. Two sections joined with hinged brackets at rear of assembly, rotating arms at front to level walking surface.
    - a. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
    - b. Modules: WW701ASSY 10 ft (3 m) Traverse and WW702ASSY 5 ft (1.5 m) Traverse, Up to 5 Degree Slopes.

- c. Modules: WW703ASSY 10 ft (3 m) Traverse and WW704ASSY 5 ft (1.5 m) Traverse, 5 to 10 Degree Slopes.
  - d. Modules: WW723ASSY 10 ft (3.0) Raised Traverse and WW724ASSY 5 ft (1.5 m) Raised Traverse, Up to 5 Degree Slopes.
- 8. System Configuration: Longitudinal; f level walking surface mounted onto sub-frame fixed to roof. Two sections joined with hinged brackets at rear of assembly, rotating arms at front to level walking surface.
  - a. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
  - b. Modules: WW709ASSY 10 ft (3 m) Longitudinal and WW710ASSY 5 ft (1.5 m) Longitudinal, Up to 5 Degree Slopes.
- 9. System Configuration: Steps; level walking surface mounted onto sub-frame fixed to roof. Two sections joined with hinged brackets at rear of assembly, rotating arms at front to level walking surface.
  - a. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
  - b. Modules: WW711ASSY 10 ft (3 m) Steps and WW712ASSY 5 ft (1.5 m) Steps, 5 to 10 Degree Slopes.

## 2.6 FABRICATION

- A. Comply with design and specified requirements.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
  - 1. Provide weep holes where water may accumulate.
  - 2. No welded connections.
  - 3. Cap exposed railing ends.
- C. Upright tops shall be plugged with weather and light resistant material.
- D. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

- C. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete and masonry construction.
  - 1. Coordinate delivery of anchorages to project site.
  - 2. Coordinate that blocking is in place for all mounting fasteners.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions including the following:
  - 1. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 ft-lbs (39.3 N-m) of torque.
  - 2. Perform cutting, drilling, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.
  - 3. Set posts plumb within a tolerance of 1/8 inch (3 mm).

### 3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

### **SECTION 07 72 33**

#### **ROOF SCUTTLE**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Furnishing and installing factory fabricated roof scuttle.

##### **1.02 RELATED SECTIONS**

- A. Section 05 50 00 - Metal Fabrications.
- B. Section 07 72 00 – Rooftop Fall Protection and Accessories

##### **1.03 QUALITY ASSURANCE**

- A. ASTM A 36-93a: Standard Specification for Structural Steel

##### **1.03 SUBMITTALS**

- A. Product Data: Provide manufacturer's product data for all materials in this specification.
- B. Shop Drawings: Show profiles, accessories, location, and dimensions.
- C. Samples: Manufacturer to provide upon request; sized to represent material adequately.
- D. Contract Closeout: Roof Scuttle manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

##### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- C. Remove protective wrapping immediately after installation.

## **1.05 JOB CONDITIONS**

- A. Verify that other trades with related work are complete before installing roof scuttle.
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.
- D. Coordinate installation with roofing manufacturers and roof insulation manufacturer's instructions before starting.
- E. Observe all appropriate OSHA safety guidelines for this work.

## **1.06 WARRANTY**

- A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. The BILCO Company, P.O. Box 1202, New Haven, CT 06505.
- B. Approved substitution.

### **2.02 ROOF SCUTTLE**

- A. Furnish and install where indicated on plans thermally broken metal roof scuttle Type S-50TB, size width: 3'-0" x length: 2'-6". Length denotes hinge side. The roof scuttle shall be single leaf. The roof scuttle shall be preassembled from the manufacturer.
- B. Performance Characteristics:
  - 1. Cover and curb shall be thermally broken to prevent heat transfer between interior and exterior surfaces.
  - 2. Cover shall be reinforced to support a minimum live load of 40 psf with a

maximum deflection of 1/150<sup>th</sup> of the span or 20 psf wind uplift.

3. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
4. Operation of the cover shall not be affected by temperatures.
5. Entire scuttle shall be weather tight with fully welded corner joints on cover and curb.

C. Cover: Shall be 11 gauge aluminum with a 5" beaded flange with formed reinforcing members. Interior and exterior surfaces shall be thermally broken to minimize heat transfer and to resist condensation. Cover shall have a heavy extruded EPDM rubber gasket bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.

D. Cover Insulation: Shall be fiberglass of 3" thick polyisocyanurate with an R-value = 20.3, fully covered and protected by a 18 gauge paint bond G-90 aluminum liner.

E. Curb: Shall be 12" in height and of 11 gauge aluminum. Interior and exterior surfaces shall be thermally broken to minimize heat transfer and to resist condensation. The curb shall be formed with a 5-1/2" flange with 7/16" holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, with clip flashing system, including stamped tabs, 6" on center, to be bent inward to hold single ply roofing membrane securely in place.

F. Curb Insulation: Shall be 3" thick polyisocyanurate with an R-value = 20.3.

G. Lifting Mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

H. Hardware:

1. Heavy stainless steel pintle hinges shall be provided.
2. Cover shall be equipped with a spring latch with interior and exterior turn handles.
3. Roof scuttle shall be equipped with interior and exterior padlock hasps.
4. The latch strike shall be a stamped component bolted to the curb assembly.
5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" diameter red vinyl grip handle to permit easy release for closing.
6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed. Springs

shall have an electro coated acrylic finish for corrosion resistance. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

- I. Finish: Factory finish shall be mill finish aluminum.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Verify that roof scuttle installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Correct defects prior to installation.
- B. Coordinate installation of roof scuttle with roof access ladder and ladder safety post. The assembly shall be a water-tight roof penetration.

### **3.02 INSTALLATION**

- A. Install roof scuttle in accordance with manufacturer's installation instructions, standard details and recommendations.
- B. The installer shall check as-built conditions and verify the manufacturer's roof scuttle details for accuracy to fit the application prior to fabrication.
- C. The installer shall furnish mechanical fasteners consistent with the roof requirements.

**END OF SECTION**

# DIVISION 7 – THERMAL AND MOISTURE PROTECTION

## SECTION 07 92 00

### SEALANTS AND CAULKING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

A. Caulking joints around openings in exterior walls, around window and door frames, between finished floor materials and sleeves wherever sleeves pass through concrete floor, under metal thresholds, between masonry and other materials, sidewalk joints, control joints and where otherwise indicated or required.

B. Caulking joints where acoustical sealant is indicated on Drawings, elsewhere in the Specifications or where required to provide the specified STC rating or acoustical barrier. For use wherever through-wall penetrations and recessed fixtures occur in such walls.

C. Foam sealant for use in acoustic- and air-sealing large gaps in interior partitions at duct, pipe, conduit and similar penetrations.

##### 1.02 REFERENCES

A. FS TT-S-230: Sealing Compound, Elastomeric Type, Single Component.

##### 1.03 SUBMITTALS

A. Catalog data and color charts for review. Sealant color will be selected for compatibility with adjoining materials.

##### 1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, tightly sealed containers or unopened packages with manufacturer's name, labels, product identification, and lot numbers where appropriate.

B. Store materials out of weather in original containers or unopened packages as recommended by manufacturer.

C. Do not use materials that have been stored for a period of time exceeding maximum recommended shelf life.

## **1.05 GUARANTEE**

A. Contractor provide his written guarantee as follows: "Caulking is guaranteed against leaks, defects of workmanship and materials for a period of 5 years from the date of Substantial Completion, and caulking and damage to building caused by such leaks will be repaired without cost to the Owner."

## **PART 2 - GENERAL**

### **2.01 MANUFACTURER**

- A. Pecora Corporation, Harleysville, PA 19438.
- B. Dow Chemical Company, Midland, MI 48674.
- C. Approved substitution.

### **2.02 MATERIALS**

- A. General Purpose Urethane Sealant: Dynatrol 1-XL. Moisture-curing single-component non-sag polyurethane sealant, Type II, Class A.
- B. Self-Leveling, Traffic Grade Polyurethane Sealant: TT-S-230C, Type I, Class A Urexpam NR-201, one part self-leveling moisture-curing urethane sealant.
- C. General Purpose Silicone Sealant: TT-S-230C Pecora 860 one-part acetoxysilicone, high-modulus acid cure, FDA approved.
- D. Backer Rod: Polyethylene foam, closed cell, compatible with sealant.
- E. Joint Cleaner: Methyl ethyl ketone, toluene, xylene.
- F. Joint Primer: Type as recommended by caulking manufacturer.
- G. Bond Breaker: Pressure sensitive adhesive polyethylene tape.
- H. Masking Tape: Pressure sensitive adhesive paper tape.
- I. Glass Block Pointing Sealant: ASTM C834 Pecora AC-20 acrylic Latex Caulking.
- J. Foam Sealant: ASTM E84 Great Stuff Insulating Foam Sealant. Closed cell, minimal-expanding single component polyurethane foam sealant for general penetration and building envelope sealing.

- K. Acoustical Sealant: AIS-919 acoustical and insulation latex sealant.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Examine joints for construction defects which would adversely affect execution of work.
- B. Ensure that masonry and concrete have cured 28 days minimum.
- C. Do not start work until conditions are satisfactory.

### **3.02 PREPARATION**

- A. Cleaning: Clean joint surfaces, using joint cleaner as necessary. Joints must be free of dust, dirt, oil, grease, rust, laitance, release agents, moisture, or other matter which might adversely affect adhesion of sealant.
- B. Masking: Mask areas adjacent to joints.
- C. Primer: Apply if required, following manufacturers instructions.

### **3.03 APPLICATION**

- A. Install bond breaker tape where recommended by sealant manufacturer.
- B. Install backing material in joints using blunt instrument to avoid puncturing. Do not twist rod while installing. Install backing so that joint depth is 50% of joint width, but a minimum of 3/8 inch deep.
- C. Apply sealant in joints using pressure gun with nozzle cut to fit joint width. Make sure sealant is deposited in uniform, continuous beads without gaps or air pockets.
- D. Tool joints to required configuration within 10 minutes of sealant application. If masking materials are used, remove immediately after tooling.
- E. Install self-leveling sealant in sidewalk joints as recommended by the manufacturer using bond breaker tape at base of joint to prevent bonding of joint filler to sealant.

### **3.04 CLEANING**

A. Remove excess materials adjacent to joints by mechanical means or with MEK, toluene or xylene as work progresses to eliminate evidence of spillage or damage to adjacent surfaces. Note: When using flammable solvents, avoid heat, sparks and open flames. Always provide adequate ventilation and follow precautions listed on solvent container label.

B. Leave finished work in neat, clean condition with no evidence of spillovers onto adjacent surfaces.

**END OF SECTION**

# **DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

## **SECTION 07 92 19**

### **ACOUSTICAL JOINT SEALANTS**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Acoustic Joint Sealant and Spray used to achieve specified acoustical rating of wall and ceiling assemblies by providing an effective barrier against sound transmission through construction joint and through-penetration openings.
- B. Only tested acoustic systems shall be used in specific locations as follows:
  - 1. Top and bottom of gypsum board partitions.
  - 2. Top of masonry walls.
  - 3. Through-penetrations in gypsum and masonry walls.

##### **1.02 RELATED SECTIONS**

- A. Refer to Section 09 21 16 – Gypsum Board Systems for acoustically rated walls and requirements.

##### **1.03 REFERENCES**

- A. ASTM C734, Standard Test Method for Low-Temperature Flexibility of Latex Sealants After Artificial Weathering.
- B. ASTM C834, Standard Specification for Latex Sealants.
- C. ASTM C919, Standard Practice for Use of Sealants in Acoustical Applications.
- D. ASTM D217, Standard Test Methods for Cone Penetration of Lubricating Grease.
- E. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. ASTM E90, Standard Test Method for Laboratory Measurement of Airborne

Sound Transmission Loss of Building Partitions and Elements.

- G. ASTM G21, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- H. ISO 11600, Building construction -- Jointing products -- Classification and requirements for sealants.

#### **1.04 QUALITY ASSURANCE**

A. Installing contractor shall arrange for the acoustic joint sealant manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of acoustic sealant and spray systems to train appropriate contractor personnel in proper selection and installation procedures.

B. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the acoustic sealant and acoustic spray manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A manufacturer's willingness to sell its acoustical sealant products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

#### **1.05 SUBMITTALS**

A. Manufacturer's specifications and technical data for each material including documentation of STC testing and manufacturer's installation instructions.

#### **1.06 PRODUCT DELIVERY, STORAGE AND HANDLING**

A. Deliver materials in original, tightly sealed containers or unopened packages with manufacturer's name, labels, product identification, and lot numbers where appropriate.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

### **PART 2 - GENERAL**

## **2.01 MANUFACTURER**

- A. Hilti, Inc., Plano, Texas.
- B. Approved substitution.

## **2.02 ACOUSTICAL SEALANTS**

A. Acoustic Sealant for Exposed and Concealed Joints and annular spaces around through-penetrations: Hilti CP 506 Smoke and Acoustic Sealant. Provide manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C834, ASTM C919 and the following:

1. Sealant effectively reduces airborne sound transmission through head-of-wall and bottom-of-wall joints and openings to accommodate through-penetrations in building construction as demonstrated by testing representative assemblies in accordance with ASTM E90.
2. Acoustical Sealant to maintain STC ratings at sound rated partitions as indicated on the drawings.
3. Sealant has flame-spread and smoke-developed ratings of less than 25 as tested in accordance with ASTM E84.
4. Sealant is mold and mildew resistant per ASTM G21 with a rating of zero (0), "no growth".
5. Sealant has movement capability of minimum 12.5% in accordance with ISO 11600.
6. Latex sealant according to ASTM C 834 class OP -18°C with shrinkage according to ASTM C 1241 < 25 % C.
7. Proposed acoustic sealant materials and methods shall conform to applicable governing codes having local jurisdiction.

B. Acoustic Sealant for bottom of walls: Hilti CP605 Bottom of Wall Sealant. Comply with standards listed for item A.

## **2.03 ACOUSTICAL SPRAYS**

A. Acoustic Spray for exposed and concealed joints: Hilti CP 572 Smoke and Acoustic Spray. Provide manufacturer's standard sprayable latex material complying with ASTM C919 and the following:

1. Spray effectively reduces airborne sound transmission through head-of-wall joints in building construction as demonstrated by testing representative assemblies in accordance with ASTM E90.
2. Acoustical Spray to maintain STC ratings at sound rated partitions as indicated on the drawings.
3. Spray has flame-spread and smoke-developed ratings of less than 25 as

- tested in accordance with ASTM E84.
4. Spray is mold and mildew resistant per ASTM G21 with a rating of zero (0), "no growth".
  5. Spray has movement capability of minimum 12.5%.
  6. Proposed acoustic spray materials and methods shall conform to applicable governing codes having local jurisdiction.

## **2.04 ACCESSORIES**

- A. Pre-formed mineral wool:
  1. CP 767 Speed Strips
  2. CP 777 Speed Plugs
- B. Mineral wool.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Verify acoustic joints are properly sized and in suitable condition for application of materials.
- C. Surfaces to which acoustic sealant and spray materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
- D. Provide masking and temporary covering to prevent soiling of adjacent surfaces by acoustic sealant and spray materials.
- E. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of acoustic sealant and spray.
- F. Notify Architect in writing of unsatisfactory conditions for completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Comply with acoustic sealant and spray manufacturer's written installation instructions for products and applications indicated.
- B. Comply with recommendations of ASTM C919 for use of joint sealants in

acoustical applications as applicable to materials, applications and conditions indicated.

C. Install acoustic sealant backings of type indicated to support sealant and spray during application in accordance with manufacturer's written installation instructions.

D. Install acoustic sealant and spray free of air pockets, embedded foreign matter, sags and ridges.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess acoustic sealant from surfaces adjacent to joint.
2. Remove excess acoustic spray from surfaces adjacent to joint as indicated on the drawings.
3. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
4. Provide concave joint configuration per Figure 8A in ASTM C1193, unless otherwise indicated.

### **3.03 FIELD QUALITY CONTROL**

A. Examine acoustic joints and penetrations to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

### **3.04 CLEANING**

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturer of acoustical joint sealants.

B. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises.

### **3.05 PROTECTION**

A. Protect acoustic joints during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Contract Completion.

**END OF SECTION**

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## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 11 13**

#### **HOLLOW METAL DOORS AND FRAMES**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Steel doors and frames.
- B. Forced entry/bullet resistant frames.

###### **1.02 RELATED SECTIONS**

- A. Section 08710 - Door Hardware.

###### **1.03 REFERENCES**

- A. ANSI A250.6 - Hardware on Standard Steel Doors (Reinforcement--Application); 1998.
- B. ANSI A250.8 - SDI Recommended Specifications for Standard Steel Doors and Frames; 1998 (revision of SDI 100-91).
- C. ASTM A 366/A 366M - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality; 1996.
- D. ASTM A 569/A 569M - Standard Specification for Commercial Steel, Sheet and Strip, Carbon (0.15 Maximum Percent), Hot-Rolled; 1997.
- E. ASTM A 591/A 591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications; 1996.
- F. ASTM A 620/A 620M - Standard Specification for Drawing Steel (DS), Sheet, Carbon, Cold-Rolled; 1997.
- G. ASTM A 653/A 653M - Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 1997.
- H. DHI A115.1G - Installation Guide for Doors and Hardware; Door and Hardware Institute; 1994.

- I. SDI 105 - Recommended Erection Instructions for Steel frames; Steel Door Institute; 1992.
- J. SDI 113 - Test Procedure and Acceptance Criteria for Apparent Thermal Performance of Steel Door and Frame Assemblies; Steel Door Institute; 1979.
- K. HMMA 862-13: Procedure 1 & 5: Classifications 1, 2, and 3 (15 minute Forced Entry portion only).
- L. UL752: Bullet Resistant Equipment, Level 8.
- M. DoS ST-STD.01.01 Rev G – Forced Entry and Ballistic Resistance of Structural Systems.
- N. ASTM F3038-14: Standard test method for timed evaluation of Forced Entry Resistant Systems.
- O. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings
- P. FEMA Technical Bulletin 4: Elevator Installation for Buildings Located in Special Flood Hazard Areas
- Q. ASCE 24: Flood Resistant Design and Construction

#### **1.04 SUBMITTALS**

- A. Product Data: Provide manufacturer's standard details and catalog data demonstrating compliance with referenced standards; installation instructions.
- B. Certificates:
  - 1. Provide manufacturer's certification that products comply with referenced standards.
  - 2. Submit certification from the manufacturer that all metal doors and frames comply with FEMA and NFIP requirements for flood resistance and corrosion protection for doors in the flood plain.
- C. Shop Drawings:
  - 1. Shop drawings showing all openings in the door schedule and/ or drawings; provide details of door design, door construction and methods of assembling sections, hardware locations, anchorage and fastening methods, door frame types, and finish requirements.
  - 2. Door, frame, and hardware schedule in accordance with SDI 111.

D. Forced Entry Bullet Resistant door and frame assemblies to be certified by an independent laboratory to applicable standards. Provide forced entry bullet resistant assemblies with minimum Third Party tested per DoS SD-STD-01.01 Rev. G and UL752, Level 8 rating.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

A. Protect products from moisture, construction traffic, and damage.

B. Store vertically under cover. Do not use non-vented plastic or canvas shelters. Should wrappers become wet, remove immediately.

C. Place units on 4 inch (100 mm) high wood sills or in a manner that will prevent rust or damage. Provide 1/4 inch (6 mm) space between doors to promote air circulation.

### **1.06 WARRANTY**

A. Provide manufacturer's written 5 year warranty against defects in materials and workmanship upon acceptance of Work.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

A. Ceco Door Products.

B. Approved substitution.

### **2.02 MATERIALS**

A. Steel Sheet for Doors and Frames:

1. Cold rolled steel: ASTM A 366/A 366M or ASTM A 620/A 620M.
2. Hot rolled steel: Pickled and oiled, ASTM A 569/A 569M, Type B.
3. Galvanized steel: ASTM A 653/A 653M; hot-dipped zinc-coated steel; hot-dipped zinc-iron alloy-coated steel of A40/ZF120 coating, minimum.

B. Steel Sheet for Anchors and Accessories: Electrolytically deposited zinc coated steel; ASTM A 591/A 591M, coating Class B, minimum.

### **2.03 DOORS AND FRAMES**

A. Comply with ANSI A250.8.

- B. Exterior Doors (Hurricane Resistant):
1. Provide insulated construction with U-value of at least 0.37 (2.70) when tested in accordance with SDI 113, with manufacturer's standard foam insulated core.
  2. Provide fire-rated doors where required.
  3. Min. level D missile impact resistance.
  4. Steel stiffened grid core and stile and rail units are exempt from thermal rating requirements.
  5. Doors shall meet DP50 design pressure requirement.
- C. High Traffic Area Doors:
1. Provide manufacturer's standard foam insulated core.
  2. Steel stiffened grid core and stile and rail units are exempt from thermal rating requirements.
- D. Full Flush Doors: Use only honeycomb cores.
1. Exception: Exterior doors; cores as specified.
- E. All Steel Doors: Level 2, Model 2 (heavy-duty, seamless design, 16 gage (1.52 mm) frames).
- F. Frames for Wood and Plastic Doors Specified Elsewhere: Level 2 steel frames.
1. Provide electrified frames for all Access Controlled doors including pre-wired cable running through the door and frame junction box at the strike location to accommodate an electric strike.
- G. Frames: Provide either knockdown field assembled or welded unit type frames unless otherwise indicated.
1. Provide electrified frames for all Access Controlled doors including pre-wired cable running through the door and frame junction box at the strike location to accommodate an electric strike.
  2. For drywall partitions provide slip-on type frames for installation after partitions are erected.
- H. Doors and frames are cleaned, phosphatized and primed with a coat of force cured rust inhibiting primer that meets or exceeds the requirements of ANSI A250.10 (120 hour continuous salt spray test per ASTM B117 and 240 hour continuous humidity test per ASTM D4585).
- I. Galvanizing: Provide units of galvanized steel where indicated on the door schedule.
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J. Glazed Lights: Provide glazing stops and beads.

## **2.04 FORCED ENTRY/BULLET RESISTANT FRAMES**

A. General: Provide frames of the type and profile indicated, not less than thickness indicated; to comply with ANSI/SDI A250.8.

1. Fabricate frames with mitered corners.
2. Fabricate frames with "closed and tight" mitered, full depth continuously welded seams, finished smooth with no visible seam unless otherwise indicated. Knock down type frames are not permitted.
3. Minimum 12 gage (0.105-inch -2.7-mm) thick steel sheet.

B. Surface Applied Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

C. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

D. Jamb Anchors: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 84 inches high.

## **PART 3 - EXECUTION**

### **3.01 FIELD CONDITIONS**

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Notify the Architect in writing of any discrepancies.

B. Verify dimensions of all door and frame openings or existing doors (strike height, hinge spacing, hinge back set, etc.) prior to producing shop drawings.

### **3.02 INSTALLATION**

A. Install frames plumb, level, rigid, and in true alignment as recommended in SDI 105 and A115.1G.

B. Install doors plumb and in true alignment and fasten to achieve the maximum operational effectiveness and appearance of the unit. Maintain clearances specified in ANSI A250.8 and NFPA 80 whichever is more restrictive.

C. Fill welded wrap-around frames in masonry construction with grout as masonry is laid-up. Brace or fasten frame in such a way to prevent pressure of the grout from deforming frame.

1. Mix grout to provide 4 inch (100 mm) maximum consistency and hand trowel into place.
2. Do not use grout mixed to thin "pumpable" consistency.

D. If additives are used in masonry or plaster work during cold weather, field coat the inside of steel frames with a bituminous compound to prevent corrosion.

E. Install doors plumb and in true alignment and fasten to achieve the maximum operational effectiveness and appearance of the unit. Maintain clearances specified. Shim as indicated in DHI A115.1G and SDI 122.

F. Install hardware in accordance with hardware manufacturer's recommendations and templates. Consult DHI A115.1G and ANSI A250.6 as necessary.

G. Install metal doors and frames in accordance with the manufacturer's instructions and FEMA/NFIP guidelines to ensure durability and flood resistance. Ensure all doors and frames below the BFE are installed to be watertight and capable of withstanding hydrostatic pressure. Apply flood-resistant sealants around all door perimeters and frame connections to prevent water ingress.

### **3.02 ADJUST AND CLEAN**

A. Adjust doors for proper operation, free from binding or other defects.

B. Clean and restore soiled surfaces. Remove scraps and debris, and leave site and a clean condition.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 11 16**

#### **DETENTION SECURITY HOLLOW METAL DOORS AND FRAMES**

##### **PART 1 - GENERAL**

###### **1.01 SUMMARY**

A. Steel doors and frames.

###### **1.02 RELATED SECTIONS**

- A. Section 08 71 00 – Door Hardware
- B. Section 08 88 56 – Ballistic Resistant Glazing
- C. Section 09 91 00 - Paints

###### **1.03 REFERENCES**

- A. ASTM A 1008 / A 1008M-03, Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
- B. ASTM A 1011 / A 1011M-03, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
- C. ASTM A 653/A 653M-02, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dipped Process, (Commercial Steel)
- D. ASTM A 666-00, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar
- E. ASTM C 143 / C 143M-00, Standard Test Method for Slump of Hydraulic Cement Concrete
- F. ANSI A 250.10 – 1998, Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
- G. ASTM F 1450-97 (2004), Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention and Correctional Facilities.

- H. ASTM F 1592-01, Standard Test Methods for Detention Hollow Metal Vision Systems
- I. ANSI / NAAMM HMMA 801-98, Glossary of Terms for Hollow Metal Doors and Frames
- J. NAAMM HMMA 803-98, Steel Tables
- K. NAAMM HMMA 820-87, Hollow Metal Frames
- L. HMMA-820 TN01-03, Grouting Hollow Metal Frames
- M. NAAMM HMMA 840-99, Installation and Storage of Hollow Metal Doors and Frames
- N. NAAMM HMMA 850-00, Fire-Rated Hollow Metal Doors and Frames, Second Edition
- O. ANSI / NAAMM HMMA 866-01, Guide Specifications for Stainless Steel Hollow Metal Doors and Frames
- P. ANSI / NFPA 80-1999, Fire Doors and Windows
- Q. ANSI / NFPA 105-1999, Recommended Practice for the Installation of Smoke Control Door Assemblies
- R. ANSI / NFPA 252-1999, Standard Methods of Fire Tests of Door Assemblies
- S. ANSI / NFPA 257-2000, Methods for Fire Test of Window Assemblies
- T. ANSI / UL 9-2000, Fire Test of Window Assemblies, 7<sup>th</sup> Edition
- U. ANSI / UL 10B-2001, Fire Test of Door Assemblies, 9<sup>th</sup> Edition
- V. ANSI / UL 10C-2001, Standard for Positive Pressure Fire Tests of Door Assemblies, 1st Edition
- W. UL 1784-01, Air Leakage Tests of Door Assemblies, 3<sup>rd</sup> Edition.
- X. ICBO UBC 7-2 (1997), Fire Tests of Door Assemblies
- Y. ICBO UBC 7-4 (1997), Fire Tests of Window Assemblies
- Z. UL 752-00, 10<sup>th</sup> Edition, Bullet Resisting Equipment

#### **1.04 TESTING AND PERFORMANCE**

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- A. Door Assembly Impact Test: Door and hardware constructed in accordance with ASTM F 1450 and with ASTM F 1450, and pass when tested in accordance with ASTM F 1450 "Door Assembly Impact Test."
- B. Detention Hollow Metal Vision System Impact Test. Pass when tested in accordance with ASTM F 1592.
- C. Door Static Load Test: Pass when tested in accordance with ASTM F 1450.
- D. Door Rack Test: Pass when tested in accordance with ASTM F 1450.
- E. Door Edge Crush Test: Pass when tested in accordance with ASTM F 1450
- F. Bullet Resistance Test: Pass when tested in accordance with UL Standard 752, and consistent with ASTM F 1450. The bullet resistance rating shall be Level 3.
- G. Test Reports: The manufacturer shall provide test reports and documentation by an independent testing laboratory in accordance with the reporting requirements of ASTM F 1450 and ASTM F 1592 certifying compliance with ANSI/NAAMM/HMMA 863, Section 1.05.
- H. Labeled Fire Rated Doors and Frames: Fire labeled doors, frames, transom frames and side light assemblies shall be provided for those openings requiring fire protection, temperature rise, or smoke and draft control ratings as determined and scheduled by the Architect. Such products shall be tested in accordance with ANSI/NFPA-252 or ANSI/UL-10B, ANSI/UL-10C or UBC 7-2; Part 1, UL 1784 or UBC 7-2; Part 2 or ANSI/NFPA 105 and constructed as listed and/or classified by a recognized testing agency having a factory inspection service.

## **1.05 SUBMITTALS**

### **A. Manufacturer's Qualification**

1. Provide manufacturer's certification that products comply with referenced standards.
2. Manufacturers shall be ISO 9001:2008 certified
3. Manufacturer's production welders shall be qualified under AWS D1.3.
4. Manufacturers shall have a minimum of ten (10) years experience successfully producing detention hollow metal of the types and sizes required in the contract documents.

### **B. Quality Criteria**

1. All door and frame construction shall be in accordance with construction of assemblies, which meet the testing requirements of Section 1.04.
2. Fire labeled doors and frames shall be constructed as tested in accordance with ASTM E 152, UL-10B or NFPA-252 and labeled by a recognized testing agency having a factory inspection service.
3. Fabrication methods shall meet Hollow Metal Manufacturers Association, HMMA, a Division of the National Association of Architectural Metal Manufacturers, NAAMM, as set forth in these specifications.

#### C. Shop Drawings

1. Show door and frame elevations and sections; show listing of opening descriptions including locations, material thicknesses, and anchors; show location and details of all openings; indicate performance grade levels on the submittal as they are shown on the contract drawings and in the door schedule.

### **1.06 WARRANTY**

All hollow metal work shall be warranted from defects in workmanship and quality for a period of one (1) year from shipment.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Trussbilt, LLC; 555 Lincoln Avenue NW; Huron, South Dakota
- B. Approved substitution.

### **2.02 DETENTION SECURITY HOLLOW METAL DOORS**

#### A. Materials

1. Doors shall be manufactured of commercial quality, level, cold-rolled steel conforming to ASTM A 1008 / A1008M CS type B or hot-rolled, pickled and oiled steel conforming to ASTM A 1011 / A 1011M CS type B. The steel shall be free of scale, pitting, coil breaks, buckles, waves or other surface blemishes or defects. Face sheets shall be for Grades 3 and 4: 0.067 in. minimum thickness, with zinc coated steel.

#### B. Construction:

1. All doors shall be of the types and sizes shown on the approved submittal drawings.

2. Door face sheets shall be joined at their vertical edges by a continuous tungsten inert gas (TIG) weld extending the full height of the door. This edge seam weld shall be sanded smooth and be neat in appearance.
3. Door thickness shall be 2 in. (50 mm) nominal to accommodate detention hardware. Doors shall be neat in appearance and free from warpage or buckle. Edge bends shall be true and straight and of minimum radius for the thickness of material used.
4. The door shall be stiffened by one of the following systems:
  - a. Continuous steel truss design core material, .015 in. (.4 mm) minimum, having truncated triangular roll formed sections extending continuously from one door face to the other, spot welded to each face sheet 2 ¾ in. (69.9 mm) oc horizontally and 3 in. (76.2 mm) oc vertically. Core material shall extend full height and width of door.
  - b. Rolled or formed 1/8 in. (3.2 mm) steel channels extending from top to bottom of door and continuous from one face to the other, spaced not more than 4 in. (101.6 mm) oc and spot welded to door faces not more than 3 in. (76.2 mm) oc vertically.
  - c. Continuous vertical hat sections, one such hat section welded to each face of the door, .053 in. (1.3 mm), with vertical webs no more than 4 in. (101.6 mm) apart. Hat sections shall be welded to each other at least 6 in. (152.4 mm) oc both sides in order to prevent separation.

Spaces between stiffeners shall be filled with fiberglass or mineral rockwool batt-type material.

5. The vertical edges shall be reinforced by a continuous steel channel extending the full height of the door and welded to both face sheets. The channels' thickness shall be not less than the thickness of the door face sheet. The top and bottom edges shall be closed with a continuous channel, the same thickness as the vertical edge channels and shall be spot-welded to the face sheet a maximum of 3 in. (76 mm) o.c. The closing end channel shall be continuously welded to the vertical reinforcing channel at all four corners producing a fully welded perimeter reinforcing channel.
6. The top and bottom end channel shall be fitted with an additional flush closing channel of the same material thickness. The flush closing channel shall be welded in place at the corners and at the center. Tops of exterior doors shall be made weather tight where specified.

7. Edge profiles shall be provided on both vertical edges of doors as follows:

Single acting doors - beveled 1/8 in. (3 mm) in 2 in. (50 mm) profile

8. Hardware reinforcements:

a. Doors shall be mortised, reinforced, drilled and tapped at the factory for completely templated mortised hardware only, in accordance with the final approved hardware schedule and templates provided by the hardware supplier. Where surface mounted hardware - or non-templated mortised hardware - is to be applied, doors shall be reinforced, and all drilling and tapping shall be done by others in the field.

b. Minimum thicknesses for hardware reinforcements shall be as follows:

- Full mortise hinges and pivots 0.167 in. (4.2 mm)
- Surface applied maximum security hinges 0.214 in. (5.4 mm)
- Strikes 0.167 in. (4.2 mm)
- Lock fronts, concealed holders,  
or surface mounted closer 0.093 in. (2.3 mm)
- All other surface applied hardware 0.093 in. (2.3 mm)

c. In cases where electrically operated hardware is required, and where shown on approved submittal drawings, hardware enclosures and junction boxes shall be provided and shall be interconnected using UL approved 0.5 in. (12 mm) minimum diameter conduit and connectors. Also, where shown on submittal drawings, junction boxes with access plates shall be provided to facilitate the proper installation of wiring. Access plates shall be the same thickness as the face sheet and fastened with a minimum of four (4) #8-32 tamper resistant machine screws, not to exceed 6 in. (152 mm) o.c.

9. Glass moldings and stops:

a. Where specified, doors shall be provided with steel moldings to secure glazing by others in accordance with glass sizes and thicknesses shown on approved submittal drawings.

b. Fixed glass molding shall be not less than 0.093 in. (2.3 mm), and shall be spot-welded to both face sheets 3.0 in. (76 mm) o.c. maximum.

- c. In glass openings where security glazing is specified and where shown on the approved submittal drawings, pressed steel angle glazing stops, no less than 0.093 in. (2.3 mm) thickness, shall be provided. Angle stops shall be mitered or notched and tight fitting at the corner joints, and secured in place using 1/4 - 20 or 1/4 - 28 button head tamper resistant machine screws with spacing necessary to satisfy the performance criteria outlined in Section 1.05.
  - d. Metal surfaces to which glazing stops are secured, and the inside of the glazing stops shall be treated for maximum paint adhesion and painted with a rust inhibitive primer prior to installation in the door, or shall be fabricated from A60 (ZF180) zinc coated steel per 2.01.A.3.
10. Speaking devices shall consist of a rectangular pattern of round holes, no more than 0.25 in. (6.4 mm) dia., in both face sheets directly across from each other. The minimum size of the rectangular hole pattern shall be 1 in. (25 mm) high x 4 in. (102 mm) wide with holes spaced no more than 1 in. (25 mm) o.c. vertically and horizontally. The interior of the door between the rectangular hole patterns shall be baffled using pressed steel sections, not less than 0.042 in. (1.0 mm), so that no objects can be passed through.
11. Food pass/cuff port openings:
- a. The food pass opening shall be a flush opening fabricated using interior Zee shaped formed sections 0.093 in. (2.3 mm) minimum thickness, securely welded to the inside of both face sheets. The four corner seams shall be continuously arc welded and dressed smooth. The finished opening shall be of such construction that it cannot be dismantled or otherwise affected by tampering or scraping.
  - b. The food pass shutter door shall be constructed from 0.067 in. (3.1 mm) thickness steel, press formed, hollow metal flush assembly with a 0.167 (4.2mm) backup plate on the inmate side.
  - c. The shutters shall be treated for maximum paint adhesion and given a shop coat of rust inhibitive primer. Shutters and food pass hardware shall be factory installed.

## **2.02 HOLLOW METAL PANELS**

- A. Hollow metal panels shall be made of the same materials and construction and finished in the same way as specified in Section 2.01 of this specification.

## 2.03 HOLLOW METAL FRAMES

### A. Materials

1. Frames shall be constructed of commercial quality, cold rolled steel conforming to ASTM A 366 or hot rolled steel conforming to ASTM A 569. The steel shall be free of scale, pitting, coil breaks or other surface defects.
2. Interior openings: Steel shall be for Grades 3 and 4, 0.067 in. (1.7 mm) minimum thickness, *zinc coated frames*.

### B. Construction:

1. All frames, shall have integral stops and be welded units of the sizes and types shown on approved submittal drawings. Frames shall be constructed in accordance with these specifications and meet performance criteria.
2. All finished work shall be neat in appearance, square, and free of defects, warps and buckles. Pressed steel members shall be straight and of uniform profile throughout their lengths.
3. Jamb, header and sill profiles shall be in accordance with the frame schedule and as shown on the approved submittal drawings.
4. Corner joints shall have all contact edges closed tight with faces mitered and stops either butted or mitered. Corner joints shall be continuously welded and the use of gussets or splice plates shall be unacceptable.
5. Minimum height of stops in door openings shall be 0.625 in. (16 mm). Height of stops on security glass or panel openings shall be as shown on approved submittal drawings. Cut-off stops, where shown, shall be capped at 45 degrees or 90 degrees at heights as shown on approved submittal drawings, and jamb joints below cut-off stops shall be tight fitting and welded, then finished as necessary to present a neat, flush appearance.
6. When shipping limitations so dictate, frames for large openings shall be fabricated in sections designated for splicing in the field by others. Where splicing is necessary, angle splices shall be installed at the corners of the profile, and shall extend at least 4 in. (102 mm) on either side of the joint. Splicing angles shall be the same gage thickness as the frame. Field splices shall be made in accordance with approved submittal drawings.



jamb with at least four (4) spot welds, or MIG welded on both sides, per anchor.

- b. Where so scheduled, adjustable floor anchors, providing not less than 2 in. (50 mm) height adjustment, shall be fastened in place with at least four (4) spot-welds per anchor.
- c. Thickness of floor anchors shall be the same as frame.

#### 10. Jamb Anchors:

##### a. Anchor Spacing

The number of anchors provided on each jamb shall be as follows:

Borrowed lite frames      2 anchors plus 1 for each 16 in. (406 mm) or fraction thereof over 36 in. (914 mm), spaced at 16 in. (406 mm) maximum between anchors

Door frames                      2 anchors plus 1 for each 16 in. (406 mm) or fraction thereof over 54 in. (1372 mm), spaced at 16 in. (406 mm) maximum between anchors (fire ratings can require additional anchors)

##### b. Embedment Type

1. Frames for installation in prefinished concrete openings shall be provided with removable faces at the jambs, and 0.167 in. x 2 in. x 2 in. (4.2 mm x 50 mm x 50 mm) angle anchors 4 in. (102 mm) long spaced as described in Paragraph 2.03.B.10.a. The frame anchors shall be located to coincide with matching embedded anchors to be provided for installation in the wall.
2. Embedded wall anchors shall consist of a 0.167 in. (4.2 mm) x 4 in. (102 mm) wide x 6 in. (152 mm) plate with 0.167 in. x 2 in. x 2 in. (4.2 mm x 50 mm x 50 mm) angle anchors 4 in. (102 mm) long welded in place at locations to match angle anchors in frames. The embedded plate shall be provided with two (2) #4 re-bar wall anchors 10 in. (254 mm) long minimum, with 2 in. (51 mm) x 90 degree turn down on ends continuously welded in place, and spaced as described in Paragraph 2.03.B.10a. Embedments shall be prime painted in accordance with Paragraph 2.03.B.14.
3. Angle anchors shall each be fastened to jamb and to embedded plate with two (2) 1 in. (2.5 mm) long arc welds at each end of the anchor. Anchors shall be shipped loose.

4. The complete anchorage system shall provide that the jamb faces be removed from the frames in the field by the contractor responsible for installation, and the frames be moved into the opening until the frame anchors contact and match the embedded anchors. The contractor responsible for installation shall field weld all anchors and install the jamb faces in place. Embedment anchoring details shall be provided on approved submittal drawings.
    - c. Frames to be installed in pre-finished concrete, masonry or steel openings shall be constructed and provided with anchoring systems of suitable design as shown on the approved submittal drawings.
11. Grout guards shall be provided at all hardware preparations, glazing stop screws and silencer preparations on frames to be set in masonry or concrete openings. Grout guards shall be sufficient to protect preparations from grout of a 4 in. (102 mm) maximum slump consistency which is hand troweled in place. All hinge grout guards and lock pockets shall be caulked after priming to ensure maximum protection from grout seepage.
  - a. Grout guards for glazing stop screws shall be factory installed and shall cover the exposed portion of the screws inside the frame throat, around the perimeter. Where mullions are required to be grouted, screws inside mullions shall be protected with grout guards.
  - b. Steel grout guards shall protect silencer preparations where accessible from the frame throat. Silencers shall be furnished and installed by the contractor responsible for frame installation except where limited access prevents installation of the metal grout guards in mullions, in which case silencers shall be factory furnished and installed.
12. All frames shall be provided with two (2) temporary steel spreaders welded to the bottom of the jambs to serve as bracing during shipping and handling. The installation contractor shall be responsible for removing, finishing, and touch-up of marks caused by spreader removal.
13. Removable glazing stops:
  - a. In openings where security glazing is specified and where shown on the approved submittal drawings, pressed steel angle glazing stops, not less than 0.093 in. (2.3 mm), shall be provided. Angle stops shall be mitered or butted and tight fitting at the corner joints, and secured in place using machine screws of the size and spacing necessary to

satisfy the performance criteria outlined in Section 1.06.D, spaced 2 in. (51 mm) maximum from each end and 8 in. (203 mm) o.c. maximum.

- b. The frame underneath the glazing stops and the inside of the glazing stops shall be treated for maximum paint adhesion and painted with a rust inhibitive primer prior to installation in the frame.

## 2.04 MANUFACTURING TOLERANCES

A. Manufacturing tolerance shall be maintained within the following limits:

1. Frames for single doors or pairs of doors:

- a. Width, measured between rabbets at the head: Nominal opening width + 1/16 in. (1.6 mm), - 1/32 in. (0.8 mm).
- b. Height (total length of jamb rabbet): Nominal opening height +/- 3/64 in. (1.2 mm).

2. Cross sectional profile dimensions (see Figure 8):

- a. Face 1/32 in. (0.8 mm)
- b. Stop 1/32 in. (0.8 mm)
- c. Rabbet 1/32 in. (0.8 mm)
- d. Depth 1/32 in. (0.8 mm)
- e. Throat 1/16 in. (1.6 mm)

3. Flatness of large frames 1/8 in. (3.1 mm) in 10 ft. (3048 mm) of length or width

4. Doors – Doors are undersized to fit the frame. Edge clearances are based upon individual door manufacturer's designs. Tolerance on actual door sizes are as follows:

- a. Width 3/64 in. (1.2 mm)
- b. Height 3/64 in. (1.2 mm)
- c. Thickness 1/16 in. (1.5 mm)
- d. Bow/flatness 1/8 in. (3.2 mm) in 7 ft. (2134 mm)

5. Hardware

- a. Cutout and template dimensions 0.015 in. (0.38 mm) - 0 in.
- b. Location 1/32 in. (0.8 mm)
- c. Between hinge centerlines +/- 1/64 in. (0.4 mm)

## 2.05 HARDWARE LOCATIONS

The location of hardware on doors and frames shall be as listed below. Note that all dimensions except the hinge locations are referenced from the finished floor as defined in Section 3.03.

### A. Hinges:

Top	7 in. (177.8 mm) from frame head to top of hinge
Bottom	10 in. (254 mm) from floor to bottom of hinge
Intermediate	centered between top and bottom hinges

B. Locks and latches 38 in. (965 mm) to centerline of knob or lever shaft

C. Deadlocks 46 in. (1168 mm) to centerline of cylinder

D. Exit hardware 38 in. (965 mm) to centerline of cross bar or as shown on hardware template

E. Door pulls 42 in. (1066 mm) to centerline of grip

F. Push/pull bars 42 in. (1066 mm) to centerline of bar

G. Arm pulls 46 in. (1168 mm) to centerline

H. Push plates 46 in. (1168 mm) to centerline of plate

I. Intercoms 48 in. (1219 mm) to centerline of intercom push button

## 2.06 FINISH

After fabrication, all tool marks and surface imperfections shall be filled and sanded as required to make face sheets, vertical edges and weld joints free from irregularities. After appropriate metal preparation, all exposed surfaces of doors and frames shall receive a rust inhibitive primer which meets or exceeds ANSI A 250.10, "Test Procedures and Acceptance Criteria for Prime Painting Steel Surfaces for Steel Doors and Frames." Refer to Section 09 91 00 – Paints for paint.

## PART 3 - EXECUTION

### 3.01 SITE STORAGE AND PROTECTION OF MATERIALS

- A. The contractor responsible for installation shall remove wraps or covers from doors and frames upon delivery at the building site. The contractor responsible for installation shall ensure that any scratches or disfigurement caused in shipping or handling are promptly sanded smooth, cleaned and touched up with a compatible rust inhibitive Direct to Metal (DTM) primer.
- B. The contractor responsible for installation shall ensure that materials are properly stored on planks or dunnage in a dry location. Doors and frames shall be stored in a vertical position and spaced by blocking. Figure 9 illustrates recommended storage positioning. Materials shall be covered to protect them from damage but in such a manner as to permit air circulation.

### 3.02 INSTALLATION

The Contractor responsible for installation shall perform the following:

- A. Prior to installation, all frames shall be checked for correct size and swing, and with temporary spreaders removed be corrected for squareness, alignment, twist and plumb. Permissible installation tolerances shall not exceed 1/16 in. (1.5 mm):

Squareness:	Measured at rabbet on a line from jamb, perpendicular to frame head.
Alignment:	Measured at jambs on a horizontal line parallel to the plane of the face.
Twist:	Measured at opposite face corners of jambs on parallel lines, perpendicular to the plane of the door rabbet.
Plumbness:	Measured at jambs on a perpendicular line from the head to the floor.

During the setting of the frames, check and maintain these tolerances for squareness, alignment, twist and plumbness.

The details in Figure 10 illustrate methods of measuring the above specified tolerances.

- B. Frame jambs shall be fully grouted to provide added security protection against battering, wedging, spreading and other means of forcing open the door. Jamb mounted lock preparations, grout guards for hardware preparations and glazing stop screws, and junction boxes are intended to protect hardware mortises, exposed removable screws, and tapped mounting holes from masonry grout of 4 in. (102 mm) maximum slump consistency which is hand troweled in place. If a light consistency grout (greater than 4 in. (102 mm) slump in accordance with ASTM C 143 / C 143M) is to be used, special precautions shall be taken in the field by the installation contractor to protect tapped holes, electrical knock-outs, lock pockets, grout guards, junction boxes, etc. in the frames. Large frame sections, such as lock columns and lock jambs, are not intended or designed to act as forms for grout or concrete. Grouting of large hollow metal sections shall be done in "lifts" or precautions shall otherwise be taken by the contractor to insure that frames are not deformed or damaged by the hydraulic forces that occur during this process.
- C. Proper door clearances shall be maintained in accordance with 3.03 of these specifications, except for special conditions otherwise noted. Where necessary, metal hinge shims, furnished by the Contractor responsible for installation, are acceptable to maintain clearances.
- D. Hardware shall be applied in accordance with hardware manufacturer's templates and instructions.
- E. Any grout or other bonding material shall be cleaned off of frames or doors immediately following installation. Exposed hollow metal surfaces shall be kept free of grout, tar, or other bonding material or sealer.
- F. Exposed field welds shall be finished smooth and touched up with a rust inhibitive primer.
- G. Primed or painted surfaces which have been scratched or otherwise marred during installation, cleaning, and/or field welding, including marks caused by spreader removal, shall promptly be finished smooth, cleaned, treated for maximum paint adhesion and touched up with a rust inhibitive Direct to Metal (DTM) primer comparable to and compatible with the shop applied primer and finish paint specified in Section 09900. All touch-up primer and finish paint must be formulated for DTM application.
- H. Finish paint in accordance with Section 09 91 00 - Paints.
- I. Install door silencers.
- J. Install glazing materials in accordance with Section 08 80 00 - Glazing.

### 3.03 CLEARANCES

- A. Edge clearances for swinging doors shall provide for the functional operation of the assembly and shall not exceed the following:
1. Between doors and frames at head and jambs: 3/16 in. (4.7 mm)
  2. Between edges of pairs of doors: 3/16 in. (4.7 mm)
  3. At doorsills where a threshold is used: 3/8 in. (9.5 mm)
  4. At doorsills where no threshold is used: 3/4 in. (19.1 mm)
  5. Between door bottom and nominal surface of floor coverings at fire rated openings as provided in ANSI/NFPA 80, 1/2 in. (12.7 mm).
- B. Clearances for detention sliding doors shall be in accordance with the approved slider device drawings furnished as part of the approved hardware schedule.

END OF SECTION

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 14 16**

#### **FLUSH WOOD DOORS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Interior fire rated and non-rated flush wood doors, solid core type.

###### **1.02 REFERENCES**

- A. NWWDA: Hardwood Veneered Flush Doors I.S., 1-A series.
- B. NFPA 80: Standard for Fire Doors and Windows.

###### **1.03 SUBMITTALS**

- A. Shop drawings for review.
- B. Guarantee.

###### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Protect doors during transit, storage and handling to prevent damage and soiling.
- B. Store doors flat on a level surface in a dry, well-ventilated building. Cover to keep clean and avoid discoloration with an opaque covering. Covering must permit air circulation.
- C. If doors are to be stored at jobsite for more than one week, seal all edges.
- D. Handle with clean gloves and do not drag doors across one another or across other surfaces.

## 1.05 WARRANTY

A. Submit two copies of 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 in face veneers, as defined in NWMA Standard Door Guarantee. The guarantee shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors. Warranty shall be in effect for time shown for the various types of doors.

1. Particle core and fire doors: Life of original installation.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURER

- A. VT Industries, Holstein, IA 51025.
- B. Ray-Bar Engineering Corporation, Azuza, CA.
- C. Total Security Solutions Inc., Fowlerville MI.
- D. Approved substitution.

### 2.02 MATERIAL

A. Solid Core Doors: Rotary cut premium grade natural birch veneer two faces, particleboard core, hardwood stiles and rails, five ply construction, Type I adhesive. Door finish to be selected from manufacturer's standard range of colors:

1. Clear coat factory pre-finished without stain for all locations. Finish to match p-lam finish, refer to section 06 41 00 - Architectural Wood Casework for p-lam finish color #1.
2. Two faces, clear coat factory pre-finished without stain (p-lam finish color #1) and chocolate (CH-18) factory pre-finished stain (p-lam finish color #2). Finish to match p-lam finish, refer to section 06 41 00 - Architectural Wood Casework for p-lam finish. For use with doors: 203A (Court Clerk), 207A (Court), 209A (Judge), 211C (Multipurpose Room), 211D (Multipurpose Room).

B. Fire Doors: Incombustible mineral core. Rating as indicated in door schedule. Rotary cut good grade natural birch veneer two faces. Hardwood stiles and rails, fire retardant treated. Face assembly adhesive Type 1, core assembly adhesive Type I. To bear UL label or Warnock Hersey label.

C. Bullet Resistant Door: wood door of fiberglass core. Door assembly to have no exposed fasteners. Joint connections to have concealed clips to provide rigid assembly. All joints and connections shall be tight, providing hairline points and true alignment of adjacent members. Standard door and frame assembly to defeat ballistic assaults from 9mm medium power through 7.62 Rifle as tested with UL Standard 752 at Underwriters Laboratories, Levels 1 through 8. Bullet-resistant glazing meeting the UL 752 – Testing for Ballistic Resistance for complete assembly including framing and panels, with a minimum of Level 3 ballistic resistance. Wood veneer to match veneer as specified in this section. Basis of design: TSS Bullet Resistant Wood Door and Frame Assembly.

D. Louvers: Provide sight proof stock louvers of same wood as face veneer, Type 109.

E. Glass Openings - Fire Rated: Cut opening at factory with approved frame shipped with the door on the same bill of lading. Install with posts on corridor side and screws on occupancy side. Frame Type 115. Allow for 1/4 inch glazing material.

F. Glass Openings - Non-fire Rated: Solid matching wood beveled bead molding. Allow for 1/4-inch glazing material, Bead 101.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. Examine door frames and verify that frames are of the correct type and have been installed as required for proper hanging of corresponding doors. Do not proceed with door installation until unsatisfactory conditions have been corrected.

B. Labeled doors must be flush mounted in labeled frames.

C. Condition doors to average prevailing humidity in installation area prior to hanging.

### **3.02 INSTALLATION**

A. Hardware: See FINISH HARDWARE section.

B. Fit doors to frame for proper fit and uniform clearance at each edge and machine for hardware. Seal cut surfaces after fitting and machining.

C. Bevel non-fire-rated doors 1/8" in 2" at lock edge.

D. Install hardware for fire rated doors in accord with the requirements of NFPA 80.

1. Clearance between door and frame shall not exceed 1/8".
2. Clearance under bottom of the door and a raised noncombustible sill shall not exceed 3/8". Where there is no sill, clearance shall not exceed 3/4" or where there is rigid floor tile, clearance shall not exceed 5/8".
3. Refer to NFPA for requirements covering builders' hardware installations.

### **3.03 ADJUST AND CLEAN**

- A. Operation: Re-hang or replace doors which do not swing or operate freely.

### **3.04 PROTECTION**

- A. Refinish or replace doors damaged during installation.
- B. Protect installed doors from damage or deterioration until acceptance of the work.

**END OF SECTION**

## **DIVISION 08 - DOORS AND WINDOWS**

### **SECTION 08 15 00**

#### **FIBERGLASS DOORS AND FRAMES**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Fiberglass reinforced plastic (FRP) Doors and Frames.
- B. Fire-rated fiberglass reinforced plastic (FRP) Doors and Frames.

##### **1.02 QUALITY ASSURANCE**

- A. Provide fiberglass reinforced door and frame units made of components of standard construction furnished by one manufacturer as coordinated assemblies.
- B. Manufacturer: Company specializing in the manufacture of fiberglass doors and frames with a minimum of five years documented experience.
- C. Construction: FRP doors and frames shall be manufactured utilizing pultruded fiberglass components for flexibility, durability, superior strength and chemical resistance. Press-molded doors and frames will not be accepted. Resin rich door edges and gelcoat are prone to chipping and cracking (brittle).
- D. Resins: Resins shall comply with USDA and FDA standards for incidental food contact.
- E. Flame Spread Rating: Flame retardant structural shapes meet the maximum flame spread rating less than or equal to 25 when tested according to ASTM E84.
- F. Fire-rated doors and frames shall conform to NFPA 252 (2008), UL10C (2001), and UL9 (2005).
- G. Hardware Reinforcements: FRP doors and frames fabricated with a minimum screw holding strength of 1,000 lbs. Tested with a #12 x 1-1/4" hinge screw.
- H. Paint Adhesion: Coating for FRP doors, panels, and frames to conform to AAMA 624-07 for color uniformity, film adhesion, specular gloss, direct impact, abrasion resistance, and chemical resistance.

I. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings

J. FEMA Technical Bulletin 4: Elevator Installation for Buildings Located in Special Flood Hazard Areas

K. ASCE 24: Flood Resistant Design and Construction

L. Certificates:

1. Submit certification from the manufacturer that all metal doors and frames comply with FEMA and NFIP requirements for flood resistance and corrosion protection for doors in the flood plain.

### 1.03 WARRANTY

A. Warranty fiberglass doors and frames for life of the initial installation against failure due to corrosion. Additionally, warranty fiberglass doors and frames for a period of 10 years against failure due to materials and workmanship, from date of substantial completion.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Edgewater FRP Door, Neenah, Wisconsin 54956
- B. Approved substitution.

### 2.02 DOORS

- A. Interior Doors: E-S series (heavy duty) from the "Cutting Edge" product line (seamless).
  1. Doors to have at least two internal full height heavy duty vertical fiberglass stiffeners for warp resistance.
  2. Expanded polystyrene solid foam core.
- B. Exterior Doors (Hurricane): E-H series (Hurricane Core) from the product line (seamless).
  1. Doors to have full height heavy duty vertical fiberglass stiffeners with solid polymer lock blocking.
  2. High density polystyrene solid foam core.

3. Min. level D missile impact resistance.
4. Doors shall meet minimum DP50 design pressure rating.

C. High Traffic Areas: E-P series (Extra Heavy Duty) or E-S series from the “Cutting Edge” product line (seamless).

1. Doors to have full height heavy duty vertical fiberglass stiffeners 6 inches on center for superior strength.
2. Expanded polystyrene solid foam core.

D. Fire-rated Doors: E-F series (Fire) from the “Cutting Edge” product line (seamless).

1. Doors to have fire-rating as indicated per schedule.
2. Fire-rated mineral core.

E. Vision Lite Systems: Lite opening shall be completely sealed utilizing fiberglass pultrusions, integrated into the units sub-frame during construction.

F. Door Louvers: Provide sight-proof louvers for doors, where indicated. Stationary louvers to be manufactured utilizing fiberglass inverted “V” blades. Louver openings shall be completely sealed in the same manner as lite openings.

G. Transom/side Panels: Transoms to be identical to the doors in construction and materials.

## **2.03 FRAMES**

A. Provide pultruded fiberglass frames for doors, transoms, sidelites and borrowed lites - where indicated.

B. Door Silencers: Except on weather-stripped frames, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.

C. Plaster Guards: Provide plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation.

## **2.04 FABRICATION**

A. General: Fabricate fiberglass door and frame units to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, 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. Stiles and Rails: Fabricate doors utilizing heavy duty pultruded fiberglass tubular members.

C. Door Faces: Laminated composite faces shall be urethane fused to the stile and rail assembly, including the vertical stiffeners and core material, utilizing a two-part 100 percent reactive urethane adhesive, and then cured under pressure until completely bonded.

D. Clearances: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between pairs of doors. Not more than 3/4 inch (19 mm) at bottom, with standard being 5/8 inch (15.9 mm) at bottom.

E. Door Edges: Lock stile to be factory beveled 1/8" in 2" for rub-free operation. Square lock-edge will not be accepted.

F. Tolerances: Maximum diagonal distortion – 1/16 inch (1.6 mm) measured with straight edge, corner-to-corner.

G. Hardware Reinforcement: Fabricate all hardware reinforcements utilizing premium high density polyethylene (HDPE) and fiberglass blocking. Any form of wood or metal reinforcements will not be accepted.

H. Exposed Fasteners: Unless otherwise indicated, provide stainless steel, countersunk flat or oval heads for exposed screws and bolts.

I. Thermal-Rated (insulating) Assemblies: At exterior locations and elsewhere shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies, with an "R" value of 11-12.

J. Hardware Preparations: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Doors and frames must be factory pre-drilled for all mortised hardware preps. Pilot and through-bolt holes for all surface mounted hardware to be drilled at the project site during installation.

K. Frame Construction: Fabricate frames to size and shape shown on drawings.

1. Fabricate frames with mitered resin-welded corners and seamless face joints.
2. Provide set-up and resin welded frames with temporary spreader bars.

L. Hardware Locations: Locate hardware as indicated on shop drawings or if not indicated, according to manufacturer's standard locations.

M. Glazing/Louver Stops: Manufacturer's standard two-piece PVC retainers.

1. Provide non-removable stops on outside of exterior and on secure side of interior doors for glass, louver, and other panels in doors.
2. Provide screw-applied, removable, glazing stops on inside of glass, louvers, and other panels in doors.

N. Astragals: Fabricate astragals for pairs of doors utilizing fiberglass materials in either flat or "T" configuration.

## **2.05 FINISHES**

A. Prime Finish: Pre-clean and shop prime each door and frame ready for finish painting.

- B. Where indicated, furnish fiberglass doors and frames factory pre-finished.
1. Finish: Manufacturers standard chemical resistant waterborne acrylic enamel topcoat.
  2. Sheen: Satin or semi-gloss - as indicated.
  3. Finish: Manufacturers chemical resistant gel-coat.

C. Door Faces: Face skins shall be smooth. Due to the unit's extra-long life expectancy, minor repairs on facings must be easily blended in the event of damage. Slightly textured gelcoat facings will not be accepted.

D. Finish on fiberglass frames must match that of the fiberglass doors to which they are installed. Gelcoated doors and polyurethane coated frames together as a unit will not be accepted.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. General: Install fiberglass doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

B. Placing Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

C. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

D. Door Installation: Fit fiberglass doors accurately in frames. Shim as necessary.

E. Install metal doors and frames in accordance with the manufacturer's instructions and FEMA/NFIP guidelines to ensure durability and flood resistance. Ensure all doors and frames below the BFE are installed to be watertight and capable of withstanding hydrostatic pressure. Apply flood-resistant sealants around all door perimeters and frame connections to prevent water ingress.

### **3.02 ADJUSTING AND CLEANING**

A. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

B. Cleaning: Clean fiberglass door and frame assemblies in accordance with manufacturer's recommended procedure.

**END OF SECTION**

## **DIVISION 08 – DOORS AND WINDOWS**

### **SECTION 08 33 00**

#### **COILING DOORS AND GRILLES**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Overhead coiling insulated service doors with motor operators.
- B. Overhead coiling wood counter doors.
- C. Accessories.

###### **1.02 RELATED SECTIONS**

- A. Section 05500 – Metal Fabrications.

###### **1.03 REFERENCES**

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 1997.
- B. NFPA 70 - National Electrical Code; National Fire Protection Association; 1996.

###### **1.04 SUBMITTALS**

- A. Provide manufacturer's standard details and catalog data. Provide installation instructions.
- B. Shop drawings for the fabrication and installation of curtains, frames, operators, connections and accessories. Indicate opening sizes, jamb, sill, and head conditions, and motor, and power source locations. Doors shall meet minimum wind design pressure rating of DP50.
- C. Provide manufacturer's operation and maintenance data.

###### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store products indoors and protect from moisture, construction traffic, and damage.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. CornellCookson, LLC, Mountain Top, PA, 18707
- B. Approved substitution.

### **2.02 OVERHEAD COILING COUNTER DOORS**

- A. Provide Model "ESC10" Rolling Counter Doors.
    - 1. Operation: Motor operator.
    - 2. Mounting: Interior face mounted on prepared opening.
  - B. Curtain and Bottom Bar:
    - 1. Slats: Galvanized Steel with Finish as Described Below: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, minimum 22 gauge ASTM A 653, Commercial Quality, galvanized steel with extruded tubular aluminum bottom bar with continuous lift handle and vinyl astragal.
    - 2. Slat Material: ASTM A 653/A 653M galvanized steel; zinc coated.
    - 3. Slat Finish: Powder coat colored finish on both sides of slat. Color: To be selected by architect from manufacturer's standard range to match wall paint color, basis of design RAL1013 .
    - 4. Slat Gage: As required by width of opening and wind loading of 20 psf (958 Pa) or 87 mph (140 km/h) in the fully closed position.
    - 5. Insulation: Environmentally safe CFC-free polyurethane foam injected to fill all voids and to provide continuous insulation protection the full height of the slat, including slat interlocks. Self-bonding to interior slat surfaces. R-value of 6.25.
    - 6. End Locks: Each end of alternate slats to be fitted with end locks to act as a wearing surface in the guides and to maintain slat alignment.
    - 7. Bottom Bar: Reinforce curtain bottom with angles, material to match curtain material.
  - C. Weather-stripping: Guide weather-stripping on both sides.
  - D. Hood:
    - 1. Material: 24 gage (0.6 mm) galvanized steel.
    - 2. Shape: Round.
    - 3. Finish: Powder coat colored finish. Color: To be selected by architect from manufacturer's standard range.
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## **2.03 INSULATED SERVICE DOOR COMPONENTS**

### **A. Overhead Counterbalances:**

1. Counterbalance: Housed in a steel pipe of diameter and wall thickness to restrict maximum deflection to 0.03 inch per foot (2.5 mm per meter) of width.
2. Springs: Helical torsion springs designed to include an overload factor of 25 percent and for optimum ease of operation; grease packed and mounted on a cold rolled steel inner shaft.
3. Spring Tension: Adjustable from outside of end bracket plate, except on integral frame construction and smaller shutters.
4. Ball Bearings: Sealed to minimize wear of pipe shaft rotation around inner shaft.
5. Motorized Doors: Very high cycle springs to satisfy in excess of 100,000 cycles.

### **B. Overhead Coiling Door/Grille Bracket Plates:**

1. Bracket Plates Carrying Pipe Counterbalancing Shaft: Not less than 1/4 inch (6 mm) thickness, square in shape; house ends of door coil.
2. Drive End Bracket Plate: Fitted with a sealed ball bearing.

### **C. Overhead Coiling Door Guide and Wall Angle Assemblies, unless otherwise indicated:**

1. Structural steel angles; 3/16 inch (5 mm) minimum thickness.
2. Depth to provide adequate slat penetration to satisfy specified wind-loading or fire rating, as applicable.

### **D. Overhead Hoods:**

1. Laterally reinforced to prevent sag.
2. Intermediate Hood Supports: Furnish where door width exceeds 16 feet (4875 mm).

## **2.04 OVERHEAD COILING WOOD DOOR**

### **A. Curtain:**

1. Slats: Solid hardwood profiles with long edges rabbeted to interlock to form sight-proof curtain.
2. Bottom rail: Solid wood profile matching grain and species of slat.
3. Wood species: Maple.
4. Factory finish doors after fabrication with stain and sealer as selected by the architect from manufacturer's standard range.

- 4. Interlocking hardware: Manufacturer's standard, concealed within slat and bottom rail profile.
  
- B. Guides: Manufacturer's standard guides for indicated counter door mounting and operation.
  
- C. Operator: Tubular electric motor operator, 110VAC 60Hz. Provide operating switch on both sides of door.
  
- D. Guide Spacers: Manufacturer's standard spacers to provide clearance for gear box.
  
- E. Hood: solid wood of same species and finish as curtain material; concealed fastener construction to facilitate hood removal for servicing counter door.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that dimensions are correct and project conditions are suitable for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
  
- B. Ensure that units are installed plumb and true, free of warp or twist, and within tolerances specified by manufacturer for smooth operation.

#### **3.03 ADJUST AND CLEAN**

- A. Clean units in accordance with manufacturer's instructions.
  
- B. Restore slight blemishes in finishes in accordance with manufacturer's instructions to match original finish. Remove and provide new units where repairs are not acceptable to the Architect.

**END OF SECTION**

## **DIVISION 08 – DOORS AND WINDOWS**

### **SECTION 08 35 00**

#### **BIFOLD DOORS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Bifold doors with motor operators and surface mounting frames.
- B. Accessories.

###### **1.02 RELATED SECTIONS**

- A. Section 05 50 00 – Metal Fabrications.
- B. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings
- C. FEMA Technical Bulletin 4: Elevator Installation for Buildings Located in Special Flood Hazard Areas
- D. ASCE 24: Flood Resistant Design and Construction

###### **1.03 SUBMITTALS**

- A. Product Data for each type of product specified consisting of manufacturer's technical Product Data and installation instructions for each type of door required, including data substantiating that products comply with requirements.
- C. Submittal Drawings showing fabrication and installation of Four-Fold metal doors including plans, elevations, sections, details of components, hardware, operating mechanism, and attachments to the other units of Work. Include wiring diagrams for coordination with electrical trade.

###### **1.04 QUALITY ASSURANCE**

- A. Doors shall be designed to withstand external or internal horizontal wind loads of 137mph (3 second gust) per ASCE 7-16. The maximum allowable deflection shall not exceed 1/120 of the span. Fiber stresses in main members shall be limited to 27,000 pounds per square inch. Doors shall have a minimum wind design pressure rating of DP50.

B. Certificates: Submit certification from the manufacturer that all metal doors and frames comply with FEMA and NFIP requirements for flood resistance and corrosion protection for doors in the flood plain.

## **1.05 DELIVERY, STORAGE, AND HANDLING**

A. Store products indoors and protect from moisture, construction traffic, and damage.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Four-Fold by Door Engineering and Manufacturing, 101 Power Dr, Mankato, MN 56001

B. Approved substitution.

### **2.02 BIFOLD DOORS**

A. Door frames of minimum 11-gauge structural steel tube with 14-gauge steel sheet on the exterior and interior faces. Sheeting shall be formed on the vertical edges with no visible welds on the interior or exterior panel faces. All frames and framing members shall be true to dimension and square in all directions, and no door shall be bowed, warped, or out of line, in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Exposed welds and welds which interfere with the installation of various parts shall be ground smooth and flush. Hurricane approved per FBC #FL17136, 120 psf positive and negative including large missile impact and HVHZ. Basis of design 701XT.

B. Surface Mounted Tube Frame: Supply pre-hung tube frame system constructed of minimum TS6x4x3/16", designed to anchor to masonry wall construction or weld to steel structure. All hinges, track supports and operator supports shall be factory attached.

C. Factory finish: Door Panels and Tube Frames shall be finished with manufacturer's standard epoxy primer and polyurethane top coat. Architect to select from Manufacturer's standard color chart or furnish sample to match, basis of design in white.

1. Operator and operating hardware shall be powder-coated manufacturer's standard white.

D. Hardware: Hardware shall include guide tracks and brackets, trolleys, center guides, not less than three pairs of jamb and fold hinges per opening, and all bolts, nuts, fasteners, etc. necessary for complete installation and operation.

1. All hardware, including hinges and trolleys, shall be bolted to the panel for easy removal for service or panel replacement.
2. Doors up to 16' wide and under 30psf windload shall require no floor mounted supports, guides or tracks.
3. Top tracks shall be adjustable on the end track hangers to allow for adjustment of the door panels in the open position and easily replaceable without removal of the door framing or operators.
4. Track Hood: A full width hood shall be provided to cover the exterior track and trolleys.

E. Hinges: Jamb hinges shall be dual shear and have two thrust bearings and two needle bearings. Fold hinges shall be stainless steel and be dual shear with two thrust bearings. All bearings shall be completely concealed within the hinge barrel and include grease zerks. All hinge pins shall be minimum  $\frac{3}{4}$ " diameter hardened steel.

F. Weatherstripping: Material shall be adjustable and readily replaceable and provide a substantially weather-tight installation. Weatherstripping at center shall be 1/16" cloth inserted neoprene and include no exposed fasteners on the exterior face of the panel. Weatherstripping at sill shall include two 1/16" cloth inserted neoprene sweeps with an aluminum retainer. The retainer shall be attached to the door with adhesive.

G. Perimeter Weatherstripping: Provide jamb and head weatherstripping of 1/16" cloth-inserted neoprene bulb (or closed cell neoprene).

H. Vision Panels: Provide 1" insulated, tempered, vision panels of the size, shape and location as noted on the drawings.

## **2.03 OPERATOR**

A. Operation by overhead mounted electro-mechanical drive units mounted on the interior face of the header. Operator consists of an electric motor, gear reducer, and rotating drive arm which folds the door to the exterior. The door shall be operated with connecting rods attached to the rotating drive arm on the operator. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be equipped with oil impregnated bronze bearings on polished shafts.

B. Operator shall be instantly reversible, open and close rapidly and start and stop gradually. Operator shall be adjustable to allow door to fully clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disengaging mechanism to convert to manual operation.

C. Electric motor shall be of sufficient size to operate doors under normal operating conditions at no more than 75 percent of rated capacity. The motor shall be wound for three phase 208/230/480 VAC, 60 Hertz operation.

D. Electric Controls: Controls shall be furnished by the door manufacturer and shall be complete for each door, and built in accordance with the latest NEMA standards. Incoming electrical shall be (Choose One): 120VAC single phase, 208VAC single phase, 208/230VAC 3-phase, 480VAC 3-phase.

1. Control panel assemblies shall be UL listed as per NFPA70.
2. Controls shall include a programmable logic controller with digital message display or LED indicators. Controller shall include programmable close timers and programmable inputs/outputs.
3. Controls shall include a variable frequency drive(s) with independent adjustment of the opening and closing speeds.
4. Enclosures shall be NEMA 4 with disconnect switch.
5. Pushbuttons (interior) for each door shall have one (1) momentary pressure three-button push-button station marked "OPEN", "CLOSE" and "STOP". Push button enclosure shall be NEMA 4.
6. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed position.
7. Safety edges: Provide monitored electric safety edges on leading edge of all doors to reverse door upon contact with obstruction.
8. Photo eyes: Provide (1) interior, jamb mounted, light Curtain type photo eyes, NEMA 4 rated. Photo eye shall cover from floor level to 72" above floor.
9. Presence Sensor: Provide (1) interior, overhead mounted, presence sensor BEA IS40P or equal. Doors over 16' tall shall include LZR-Widescan or equal.
10. Radio controls: Provide one (1) radio receiver and (1) single button remotes per door. Remotes to open and close doors with single button.
11. Wiring: Door manufacturer shall supply controls and components only. Electrical contractor shall install controls and furnish and install conduits and wiring for jobsite power and control wiring.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

A. Install Four-Fold metal doors in strict accordance with the approved drawings by qualified door erection crews. All door openings shall be completely prepared by the general contractor prior to the installation of the doors. Permanent or temporary electric

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wiring shall be brought to the door opening before installation is started and shall be completed so as not to delay the inspection test.

B. Doors shall be set plumb, level, and square, and with all parts properly fastened and mounted. All moving parts shall be tested and adjusted and left in good operating condition.

C. Install metal doors and frames in accordance with the manufacturer's instructions and FEMA/NFIP guidelines to ensure durability and flood resistance. Ensure all doors and frames below the BFE are installed to be watertight and capable of withstanding hydrostatic pressure. Apply flood-resistant sealants around all door perimeters and frame connections to prevent water ingress.

### **3.2 ADJUSTING AND CLEANING**

A. Inspection of the doors and a complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.

B. Clean surfaces and repaint abraded or damaged finished surfaces to match factory-applied finish.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 41 00**

#### **ALUMINUM ENTRANCES AND STOREFRONTS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Aluminum and glass entrance frames, doors and sidelites, and related items necessary to complete the work.

###### **1.02 REFERENCES**

A. ASTM B221: Specification for Aluminum and Aluminum Alloy, Extruded Bars, Rods Wires, Shapes and Tubes.

B. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings

C. FEMA Technical Bulletin 4: Elevator Installation for Buildings Located in Special Flood Hazard Areas

D. ASCE 24: Flood Resistant Design and Construction

###### **1.03 SUBMITTALS**

A. Product Data including construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed storefront system indicated.

B. Shop drawings for review. Drawings shall include wind pressure DP ratings.

C. Fabrication Sample of each type of aluminum-framed systems, made from 12" lengths of full-size components and showing details of:

1. Joinery.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

D. Certificates: Submit certification from the manufacturer that all metal doors and frames comply with FEMA and NFIP requirements for flood resistance and corrosion protection for doors in the flood plain.

#### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

A. Deliver, store and handle entrance components to prevent damage of any nature.

#### **1.05 QUALITY ASSURANCE**

A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of providing aluminum-framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.

#### **1.06 WARRANTY**

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty. Warranty Period: Two (2) years from Date of Substantial Completion of the project.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURER**

A. Kawneer Company, Inc., Norcross, GA 30092.

B. Approved substitution.

#### **2.02 MATERIALS**

A. Aluminum Members:

1. Extruded shapes, rods, bars, tubing: ASTM B221, Alloy 6063-T5.
2. Castings: Aluminum alloy of sufficient thickness and strength for intended purpose.

- B. Fasteners: Bolts, nuts, screws and rivets. Aluminum or stainless steel.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Sealant: sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

**2.03 FABRICATION**

- A. Form miters and joints with flush, hairline joints. Remove burrs.
- B. Joints between sections and field splices and field splices shall produce strength to resist deformation and misalignment.
- C. Fabricate and install with concealed fastenings insofar as practicable.
- D. Paint concealed surfaces of aluminum with black asphaltum where touching concrete or masonry.

**2.04 THERMAL DOORS**

A. Doors: Kawneer 350T Insulpour Thermal Entrance Door with stiles and rails fabricated from extruded tubular shapes with walls not less than 0.125 inch thick, clear anodized, Architectural Class I, #14 Clear. Glazing molding to be 0.05 inch thick. Integral thermal barrier: IsoPour consisting of two continuous rows of polypropylene with a 7/32" separation consisting of a two-part, chemically curing high density polyurethane, mechanically and adhesively bonded to the aluminum at door rails and stiles.

Door 350	Vertical Stile 3-1/2"	Top Rail 3-1/2"	Optional Bottom Rail 10"
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- B. Glazing Mouldings: Snap-in type, coated to match rails. Insulated glazing.
- C. Glazing Gaskets: EPDM elastomeric extrusions.

**2.05 NON-THERMAL DOORS**

A. Doors: Kawneer 350 Standard Entrance Door with stiles and rails fabricated from extruded tubular shapes with walls not less than 0.125 inch thick, clear anodized, Architectural Class I, #14 Clear. Glazing molding to be 0.05 inch thick.

Door 350	Vertical Stile 3-1/2"	Top Rail 3-1/2"	Optional Bottom Rail 10"
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- B. Glazing Mouldings: Snap-in type, coated to match rails. Insulated glazing.
- C. Glazing Gaskets: EPDM elastomeric extrusions.

## 2.06 THERMAL FRAMES

- A. Fabricate from extruded tubular shapes with walls not less than 1/8 inch thick, clear anodized, Architectural Class I, #14 Clear.
  - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Framing: Kawneer Trifab VG 451T, 2" x 4-1/2", shear block fabrication. Insulated glazing. Kawneer IsoLock Thermal Break with a 1/4" separation consisting of a two-part chemically curing, high-density polyurethane, mechanically and adhesively joined to aluminum storefront sections.

## 2.07 NON-THERMAL FRAMES

- A. Fabricate from extruded tubular shapes with walls not less than 1/8 inch thick, clear anodized, Architectural Class I, #14 Clear.
- B. Framing: Kawneer Trifab VG 451, 2" x 4-1/2", shear block fabrication. Single pane glazing.

## 2.08 GLAZING SYSTEMS

- A. Glazing: As specified in Division 08 80 00 Glazing.
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
  - 1. Structural Sealant: ASTM C 1184, single-component neutral-curing

silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated. Color: Black

2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use. Color: Matching structural sealant.

## **2.09 HARDWARE**

A. Furnished and installed by aluminum entrance system installer.

1. Closer: Norton 1605 surface closer.
2. Pivots: Top, bottom and intermediate offset pivots.
3. Push and Pull: Round bent bar CP-2/CO-9 clear anodized #14.
4. Lock: Adams Rite 4510 dead latch, lever design. Cylinder furnished by finish hardware supplier and keyed to building.
5. Exit device: Kawneer 1786 Rim Exit Device.
6. Threshold: For offset pivot and overhead closer. Extruded aluminum, one piece per door opening, with ribbed surface.
7. Weatherstripping: Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin. Door weathering on a single acting offset pivot shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.

B. Furnished and installed by Owner's separate vendor, provide factory prepared doors and frames to receive hardware installation by others:

1. Lockset and Electric Strike: as specified by access control system.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. Comply with manufacturer's latest written specifications and recommendations for installation of aluminum frames and doors.

B. Set units plumb, level and true and in alignment with other work.

C. Anchor securely in place. Separate dissimilar materials with suitable materials.

D. Install metal doors and frames in accordance with the manufacturer's instructions and FEMA/NFIP guidelines to ensure durability and flood resistance. Ensure all doors and frames below the BFE are installed to be watertight and capable of withstanding hydrostatic pressure. Apply flood-resistant sealants around all door perimeters and frame connections to prevent water ingress.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 47 00**

#### **AUTOMATIC DOOR OPERATORS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Automatic swing door operator consisting of operator housing, swing power operator, electronic control, wire harnesses and connecting hardware.

###### **1.02 RELATED SECTIONS**

- A. Section 08 41 00 - Aluminum Entrances & Storefronts
- B. Section 08 80 00 - Glazing
- C. Section 07 92 00 – Sealants and Caulks
- D. Electrical Drawings for Electrical Specifications

###### **1.03 REFERENCES**

- A. Unit described complies with current ANSI A156.10 for Power Operated Pedestrian Doors. Unit described complies with current ANSI A156.19 for Power Assist and Low Energy Power Operated Doors and with ANSI A117.1.
- B. Unit is listed with UL 325 standard for Door, Drapery, Gate, Louver, and Window Operators and Systems and UL991.
- C. Unit complies with NFPA 101 Life Safety Code
- D. Unit complies with NFPA 70 National Electrical Code

###### **1.04 PERFORMANCE REQUIREMENTS**

- A. Automatic door equipment accommodates medium to heavy pedestrian traffic and up to 300 pound (136kg) weight of doors.
- B. Operator capable of operating within temperature ranges of -20°F (-29°C) and 160°F (71°C).

###### **1.05 SUBMITTALS**

A. Product Data: Submit manufacturer's product data and standard details for automatic operators.

B. Shop Drawings: Submit shop drawings for the fabrication and installation of automatic operators and associated components of the work. Include anchors, hardware and other components not included in manufacturer's standard data.

#### **1.06 OPERATION AND MAINTENANCE DATA**

A. Spare parts list and owners manual are available from the manufacturer

#### **1.07 QUALITY ASSURANCE**

A. Install operator in accordance with current ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors and local applicable codes. For low energy applications, install operator in accordance with ANSI A156.19, ANSI 117.1, NFPA 101 and local applicable codes. The system fulfills Americans with Disabilities Act (ADA) requirements for barrier free entrances. All clear door openings must be at least 32" (813mm) wide to comply.

#### **1.08 QUALIFICATIONS**

A. Company specializing in manufacturing the products specified in this section shall have minimum ten years experience and be a member of the American Association of Automatic Door Manufacturers (AAADM). Prior to placing door(s) in operation, an AAADM technician should inspect the doors to check for compliance with current ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

B. Manufacturer to provide FACTORY owned central dispatch system for warranty service throughout North America. System to be available 24 hours a day, 365 days per year with a factory employee (not an answering service) to obtain malfunction information and dispatch appropriate service agency to the customer location. Toll free telephone number shall be prominently displayed on header of each operator. To insure quality service dispatching, outside contractors or answering services will not be accepted.

#### **1.09 WARRANTY**

A. Automatic door components are warranted to be free of defects in materials or workmanship under normal use for a period of one year from the date of Substantial Completion factory when an authorized manufacturer's provider has installed the components. Abuse, misuse, modification or improper repair or service by unauthorized technicians negates this warranty. During the period of this warranty manufacturer, at its sole option, will repair or replace any automatic door component or parts thereof found to be defective in material or workmanship if any necessary return charges are prepaid. Components repaired or replaced under this warranty are warranted only for the remainder

of the period covered by this warranty.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Provide Swingmaster 900 overhead concealed operator as manufactured by Besam US Inc., 1900 Airport Road, Monroe, North Carolina 28110. Toll Free (866) 237-2687. Phone (704) 290-5520. Fax (704) 290-5544. Web Site [www.besam.com](http://www.besam.com). E-Mail [marketing@besam-usa.com](mailto:marketing@besam-usa.com).

1. Approved substitution.

B. Installation to be performed by the manufacturer's approved local provider.

### **2.02 EQUIPMENT**

A. Swingmaster automatic swing door operator consisting of operator housing, swing power operator, electronic control, wire harnesses and connecting hardware.

### **2.03 AUTOMATIC SWING DOOR OPERATOR**

A. Operator: Electro-mechanical operator, powered by 24 volt, 1/4 hp motor with field serviceable motor brushes. Completely assembled and sealed unit which includes helical gear drive transmission and interconnected rack and gear system for compression of exterior replaceable heavy duty spiral spring, all contained within a die cast aluminum housing and filled with special lubricant for extreme temperature conditions. Drive shaft is minimum 15/16" (24mm) thick containing 14 tooth splines to maximize bearing surface contact with drive arm assembly to eliminate slippage. Interfaced with the transmission system is a DC shunt-wound permanent magnet motor with sealed ball bearings. System operates from 120 VAC-60 cycle-1 phase power supply. Operator is mounted in the header case housing using vibration isolators to maintain quiet operation. Operator is to be non-handed and be able to push or pull the door open to 90°. Integrated microprocessor control utilizing the optional CUHub coordinates all ANSI A156.10 required safety sensor systems. Only full duty operators accepted. No low energy or mid duty operators accepted.

B. ADA Recommendation: When door is used in conjunction with push plates and manual operation, the Swingmaster 900 series can be adjusted to meet the ANSI A156.19 when used on doors 36" (914mm) or greater.

C. Operator Housing: Non-handed operator is completely contained in a 6" (152mm) wide x 6" (152mm) high extruded aluminum housing. All aluminum sections are 6063-T5 alloy and have a minimum thickness of .156" (4mm). The operator housing provides a seal against dust, dirt and moisture.

D. **Electronic Controls:** A self-contained, solid-state integrated circuit controls the operations and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. No external or auxiliary low voltage power source will be allowed. The control includes adjustable time delay (1 to 60 seconds) for normal cycle. Control unit must also include wake up protection for power outages and panic breakaway. The Swingmaster 900 CU2 control also has the following built in features:

1. Torque limiting for controlled forces on opening.
2. Acceleration control for smooth starts and recycle.
3. Special circuitry for reducing power to the motor when door is in HOLD-OPEN mode, extending longevity and assuring reliability.
4. Ramp down control for back-check.
5. Plug-N-Play ready to reduce mis-wiring and labor.
6. Ribbon Harness for plug-n-play interface with CUHub and sensors. No screw lug terminals or wire nut connections will be accepted.

E. **Connecting Hardware:** Surface mounted operator is connected to the door by means of a cast steel door arm. The door arm is secured to the top rail of the swing door using one piece threaded tubular inserts for aluminum doors, 1/4-20 binding head and post screws (sex bolts) for wood and hollow metal doors. The toothed door arm adaptor is broached for positive engagement with the shaft and requires no additional linkage, slide blocks or tracks. The appearance of the top rail of the swing door shall be modified in order to attach the door arm.

F. **Power Open:** Automatic door operator powers the door open by forces transmitted mechanically to the drive shaft and maintains a constant engagement throughout the opening cycle. Operator is designed to counteract most normal exterior wind conditions and/or interior stack pressure without the need of additional power assist mechanisms. The automatic door system functions as a manual door closer in the event of a power failure. The automatic door system is electro-mechanical in design requiring no remote pumps or compressors.

G. **Spring Close:** Automatic door operator is spring closed. Spring is designed to withstand most normal wind conditions and return the door to the full closed position. Closing forces regulated by utilizing the motor and gear assembly as a dynamic brake. The spring is compression type to ensure longevity.

H. **Emergency Breakaway:** All in-swing doors, which are required exits, are equipped with an emergency breakaway switch which internally cuts power to the operator. No external power switch will be allowed. The breakaway feature allows center-pivoted doors to swing in the direction of egress with forces that comply with current ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors. Following emergency breakaway the doors shall return to the full closed position and electrically reset automatically. System must include a wake up circuit of no less than 3 seconds to allow the

safety system to survey the surroundings to prevent ghost openings or recycling.

## **2.04 SENSOR SYSTEMS**

A. Actuation and safety devices are as indicated on door schedule and specified herein. Controls cause door to open instantly when device(s) located on approach side of door is actuated; hold door in open position, and cause door to close unless safety device or re-actuation of opening impulse overrides such operation.

1. Motion sensor.
2. Overhead presence sensor.

## **2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS**

A. Electrical Characteristics: Electrical is 120V, 60 Hz, 10 amp electrical power supply to the operator. ELECTRICAL CONTRACTOR NOTE: provide two low voltage 18 gauge stranded wires from automatic operator to each remote (50 feet max.) activation devices (if required).

## **2.06 GUIDE RAILS**

A. To be provided and installed by manufacturer's local provider per current ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

## **2.07 FINISHES**

A. All exposed aluminum surfaces to match door finish as scheduled.

# **PART 3 - EXECUTION**

## **3.01 EXAMINATION**

A. Verify the openings are plumb and are dimensioned properly. Insure adequate support has been provided at the operator header. Proceed with the installation only after conditions are deemed satisfactory.

## **3.02 INSTALLATION AND ADJUSTMENT**

A. Install equipment in accordance with manufacturer's installation instructions. Adjust equipment per instructions and current ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 51 00**

#### **ALUMINUM WINDOWS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Heavy commercial grade thermal break insulated aluminum fixed and casement windows, and related items necessary to complete the work.

###### **1.02 REFERENCES**

A. ASTM B 221: Specification for Aluminum and Aluminum Alloy, Extruded Bars, Rods Wires, Shapes and Tubes.

B. ASTM E 330 for structural performance.

C. ASTM E 283 for air infiltration.

D. ASTM E 331 and E 547 for water penetration.

E. FEMA Technical Bulletin 8: Corrosion Protection for Metal Connectors and Fasteners in Coastal Areas

G. ASCE 24: Flood Resistant Design and Construction

###### **1.03 SUBMITTALS**

A. Shop drawings of each type of window for review, including the following information:

1. Typical unit elevations at  $\frac{3}{4}$ " scale.
2. Full size details indicating anchors, hardware, operators, accessories and glazing details.
3. Wind pressure DP rating.

B. Product data indicating fabrication method, finishing, hardware and accessories.

C. Full size samples of each window type with specified finish.

D. Certification by the manufacturer showing that each type, grade and size of window unit complies with the specified testing requirements.

E. For window within or below base flood elevation. Submit product data for all metal windows, including flood-resistant features and corrosion-resistant components. Provide manufacturer's certifications that all windows comply with FEMA and NFIP requirements for flood resistance and corrosion protection. Submit shop drawings indicating materials, dimensions, and installation details.

#### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

A. Deliver, store and handle entrance components to prevent damage of any nature.

#### **1.05 WARRANTY**

A. Furnish a special project warranty, executed by the contractor, installer and aluminum window manufacturer, agreeing to repair or replace aluminum window units which fail in materials or workmanship within the specified warranty period.

B. Failures include, but are not limited to, structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation of sash and hardware, and deterioration of metals, metal finishes and other materials beyond normal weathering. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

C. Warranty period for aluminum windows is 3 years after the date of substantial completion.

#### **1.06 TESTING**

A. Structural Performance: Provide units with no failure or permanent deflection for a positive (inward) and negative (outward) test pressure of 100 lbf/sq.ft. for fixed windows.

B. Air Infiltration: Provide units with no air infiltration rate not more than 0.10 cfm/ft. of operable sash joint for an inward test pressure of 6.24 lbf/sq.ft.

C. Water Resistance: Provide units with no water penetration as defined in the test method at an inward test pressure of 15 PSF.

D. Condensation Resistance: Provide units which have been tested for thermal performance in accordance with AAMA 1502 showing a condensation resistance factor (CRF) of 59.

E. Thermal Transmittance Value: Provide window units which have a "U"-value maximum of 0.38.

F. Sound Insulation Construction: Fabricate window units that have been certified

to provide a sound transmission class (STC) rating of at least 34 when tested in accordance with ASTM E 90 and classified according to ASTM E 413.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Kawneer Company, Inc., Norcross, GA 30092.

1. Series 8225TL Isolock.

B. Approved substitution.

### **2.02 MATERIALS**

A. Aluminum Extrusions:

1. 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 ultimate tensile strength and not less than 0.125" thickness at any location for main frame and sash members.

B. Fasteners: Aluminum or stainless steel. Do not use exposed fasteners.

C. Anchors, Clips and Accessories: Fabricate of aluminum, non-magnetic stainless steel or hot-dipped zinc-coated steel or iron complying with ASTM A 386. Provide sufficient strength to withstand design pressure indicated.

D. Compression Type Glazing Strips and Weatherstripping: At manufacturer's option, provide molded EPDM or neoprene gaskets complying with AAMA SG-1 or molded PVC gaskets complying with ASTM D 2287, or molded expanded EPDM gaskets complying with ASTM C 509, Grade 4.

E. Sliding Type Weatherstripping: Provide woven type of wool, nylon or polypropylene pile and resin-impregnated backing fabric, and aluminum backing strip. Comply with AAMA 701.2.

F. Finish: Architectural Class I, #14 clear anodized.

G. For aluminum windows in the base flood elevation:

1. Ensure windows are designed to be watertight and capable of withstanding hydrostatic pressure and wind loads during flooding events.
2. Use laminated safety glass or impact-resistant glazing that meets or exceeds the requirements for flood-resistant construction as per ASCE 24.

3. Install watertight seals and gaskets around all window perimeters to prevent water ingress during flooding.
4. Ensure seals are compatible with window frame materials and designed to maintain watertightness under hydrostatic pressure.

### **2.03 FABRICATION**

- A. Form miters and joints with flush, hairline joints. Remove burrs.
- B. Joints between sections and field splices and field splices shall produce strength to resist deformation and misalignment.
- C. Fabricate and install with concealed fastenings insofar as practicable.
- D. Paint concealed surfaces of aluminum with black asphaltum where touching concrete or masonry.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Comply with manufacturer's latest written specifications and recommendations for installation of aluminum frames and doors.
- B. Set units plumb, level and true and in alignment with other work.
- C. Anchor securely in place. Separate dissimilar materials with suitable materials.
- D. For aluminum windows in the base flood elevation:
  1. Install metal windows in accordance with the manufacturer's instructions and FEMA/NFIP guidelines to ensure durability and flood resistance.
  2. Ensure proper alignment, sealing, and anchoring of all components during installation.
  3. Ensure all windows within or below the base flood elevation (BFE) are watertight and capable of withstanding hydrostatic pressure.
  4. Apply flood-resistant sealants around all window perimeters and frame connections to prevent water ingress.
  5. Perform watertightness tests on installed windows to confirm proper sealing and resistance to hydrostatic pressure.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 56 00**

#### **ALUMINUM SLIDING SERVICE WINDOWS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Medium duty commercial interior sliding service window as indicated in drawings.

###### **1.02 REFERENCES**

- A. ASTM B 221: Specification for Aluminum and Aluminum Alloy, Extruded Bars, Rods Wires, Shapes and Tubes.
- B. ASTM E 330 for structural performance.
- C. Section 08 88 56 – Ballistic Resistant Glazing

###### **1.03 SUBMITTALS**

- A. Shop drawings of each type of window for review, including the following information:
  - 1. Typical unit elevations at 3/4" scale.
  - 2. Full size details indicating anchors, hardware, operators, accessories and glazing details.
  - 3. Wind pressure DP rating.
- B. Product data indicating fabrication method, finishing, hardware and accessories.
- C. Certification by the manufacturer showing that each type, grade and size of window unit complies with the specified testing requirements.

###### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver windows crated to provide protection during transit and job site storage.
- B. Inspect windows upon delivery for damage. Damaged parts should be removed and replaced.

C. Store windows at building site under cover in a dry location.

## **1.05 WARRANTY**

A. Furnish a special project warranty, executed by the contractor, installer and aluminum window manufacturer, agreeing to repair or replace aluminum window units which fail in materials or workmanship within the specified warranty period.

B. All material and workmanship shall be warranted against defects for a period of one (1) year from substantial completion.

C. Finish Warranty: Manufacturer's warranty against deterioration of factory finishes for the period of 5 years from the date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Total Security Solutions, Fowlerville, MI 48836.

1. TSS Hole and Backer Transaction Window, Bullet Resistant Sliding Transaction Aluminum Window Frame

B. Approved substitution.

### **2.02 MATERIALS**

A. Frames:

1. Aluminum frames of 6061-T6 Aluminum, with armor to meet ballistic level requirements. Ballistic level requirements as indicated in section 08 88 56 – Ballistic Resistant Glazing. Interior screws. Transaction windows with stainless steel counters.

B. Finish: All Aluminum shall be Architectural Class I, clear coating AA-M10C22A41 Mechanical Finish Chemical Finish: etched, medium matte; 0.70 mils minimum complying with AAMA 611 "Voluntary Specification for Anodized Architectural Aluminum"

C. Glazing: see section 08 88 56 – Ballistic Resistant Glazing.

D. Hardware: Provide typical slide lock.

- E. Provide concealed sash balance at top of window frame on vertical sliding window. Use overhead track configuration D6.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Comply with manufacturer's latest written specifications and recommendations for installation of aluminum window. Repair damaged units as directed or replace with new units.
- B. Set units plumb, level and true and in alignment with other work.
- C. Anchor securely in place. Separate dissimilar materials with suitable materials.
- D. Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer's instructions. Remove excess glazing sealant compounds, dirt or other substances.
- E. Institute protective measures throughout the remainder of the construction period to ensure that the windows do not incur any damage or deterioration, other than normal weathering, at the time of acceptance.

**END OF SECTION**

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## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 71 00**

#### **DOOR HARDWARE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. This section covers door hardware.
- B. Furnish suitable hardware for lead-shielded areas such as the X-Ray Room. Suitability is measured by certification for intended use and structural capacity to carry the load of the lead lined door and frame it supports.

###### **1.02 REFERENCES**

- A. The publications listed below form a part of this section to the extent referenced:
  - 1. ALUMINUM ASSOCIATION (AA)
    - a. AA DAF-45, Designation System for Aluminum Finishes
  - 2. BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)
    - a. BHMA A156.1, Butts and Hinges
    - b. BHMA A156.13, Mortise Locks and Latches
    - c. BHMA A156.16, Auxiliary Hardware
    - d. BHMA A156.18, Materials and Finishes
    - e. BHMA A156.2, Thresholds
    - f. BHMA A156.4, Door Controls - Closers
    - g. BHMA A156.5, Auxiliary Locks & Associated Products
    - h. BHMA A156.6, Architectural Door Trim
  - 3. STEEL DOOR INSTITUTE (SDOI)
    - a. SDI-100, Standard Steel Doors and Frames

###### **1.03 SUBMITTALS**

- A. The following shall be submitted in accordance with Section 01300, "Submittals," in sufficient detail to show full compliance with the specification:
  - 1. Manufacturer's Catalog Data shall be submitted for the following items, as scheduled:
    - a. Fasteners.
    - b. Hinges.
    - c. Locksets.
    - d. Pulls and push plates.

- e. Thresholds.
  - f. Lever extension flush bolts.
  - g. Closers.
  - h. Astragals.
  - i. Coordinating device.
  - j. Door holders.
  - k. Door stops.
  - l. Door silencers.
  - m. Metal kick plates.
  - n. Door sill weather-stripping.
  - o. Panic Exit Devices.
2. Hardware Schedule indicating the door and frame location, type, size, swing, bevel, material, hardware type by Builders' Hardware Manufacturers Association (BHMA) numbers, and the respective manufacturer's type, name, number, finish, and design, Material, Equipment and Fixture Lists shall be provided prior to the hardware schedule, showing a list of the proposed Finish Hardware by manufacturer, type, name, series, material and finish.

## **PART 2 - PRODUCTS**

### **2.01 FASTENERS**

A. Fasteners of the proper type, size, quantity, and finish for each hardware item shall be provided. All visible fasteners shall be Phillips-head, bronze or stainless steel finished to match specified hardware.

### **2.02 HINGES**

A. Hinges shall be full mortise, heavy weight, anti-friction bearing, button tip, template type conforming to BHMA A156.1, Grade 1. Size shall be 4-1/2 by 4-1/2 inches.

### **2.03 LOCKSETS**

A. Mortise locksets and latch-sets shall conform to BHMA A156.13.

B. Locksets and latch-sets shall have standardized fronts, cases, and strikes so that varying functions will be interchangeable and will require only one mortise for their installation. Locks and latches shall have beveled bronze fronts, bronze bolts and strikes, brass hubs, and cases with specified finish. Locks shall have cylinders conforming to BHMA A156.5.

C. Locksets and lock cylinders shall be master keyed to the key system established for the installation.

D. Heavy duty usage mortise locksets and latch-sets shall be Series 1000, Grade 1.

#### **2.04 PULLS AND PUSH PLATES**

A. Pulls and push plates shall conform to BHMA A156.6, types and material specified herein.

1. Door pulls on plates shall be Type J405, specified finish, with the wrought plate not less than 14 by 3-1/2 inches by 0.050-inch thick, grip center to center, 6 inches, with cutouts for cylinders and thumb turns as required.
2. Push plates shall be stainless steel, specified finish, Type J301 or J302, not less than 3-1/2 by 14 inches by 0.050-inch thick, with cutouts for cylinders and thumb turns as required.

#### **2.05 THRESHOLDS**

A. Thresholds shall be extruded aluminum 6063-alloy mill finish conforming to BHMA A156.21, Type J601 (corrugated).

B. Thresholds shall be provided for the full width of the opening at exterior doors.

#### **2.06 LEVER EXTENSION FLUSH BOLTS**

A. Flush bolts shall be cast or extruded aluminum, specified finish, conforming to BHMA A156.16, with 12-inch lever extensions.

#### **2.07 CLOSERS**

A. Closers shall conform to BHMA A156.4.

B. Closers shall be the surface mounted heavy duty, parallel arm type, Grade

1. Style shall be modern.

C. Brackets, reinforcing plates, and accessory fittings shall be provided as required.

#### **2.08 ASTRAGALS**

A. Astragals shall be prime steel, 13-gage minimum by 1-5/8-inch minimum.

#### **2.09 COORDINATING DEVICE**

A. A coordinating device shall be provided for each pair of doors with an overlapping astragal or with rabbeted stiles.

B. Coordinating devices shall conform to BHMA A156.3, bronze or stainless steel,

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finish to match the locksets.

## **2.10 MISCELLANEOUS HARDWARE**

A. General: Miscellaneous hardware shall conform to BHMA A156.16, except as noted, and shall match or have the same finish as lockset finish.

B. Door Stops:

1. Door stops and bumpers shall conform to BHMA A156.16.
2. Door stops shall be heavy-duty Type C01541 (overhead mounted). Where impossible to install overhead-mounted door stops, wall mounted stops Type L02251 (wall bumper), floor mounted stops Type L02141 (dome type) or Type L02161 (dome type for door with thresholds) shall be submitted for review by Owner.

C. Door Silencers:

1. Door silencers conforming to BHMA A156.16 shall be provided except on fire-rated door frames.
2. Door silencers shall be Type L03011 for metal frames and Type L03021 for wood frames.

D. Metal Kick Plates:

1. Plates shall be 0.050-inch thick stainless steel, bevel edge, Type J102 (Kick), conforming to BHMA A156.6, finish as specified herein. Width of kick plates shall be 2 inches less than the door width. Height of kick plates shall be 8 inches.

E. Door Shoes:

1. Extruded tempered aluminum 6063-T6 with thermo-plastic elastomer seal. Width to be equal to door bottom. Fasten with stainless steel screws.

F. Sliding Barn Door:

1. Serenity Sliding Door – SyncSlide Sliding Barn Door. Hardware to include extruded aluminum top track for surface mount application, sound seals, soft-closing dampeners, concealed floor guide, simultaneous movement, standard straight pull handles finished in US32D satin stainless steel.

G. No Touch Door Opener:

1. Step-N-Pull Foot Operated Door Opener. Stainless steel or extruded aluminum foot operated pull for any commercial wood, glass, or metal door. For use with latchless bathroom doors. Nominally 5" wide, 1.5" high,

and 3" deep. Mounted 1/8" from bottom and outer edge of the doors, and attached with 1 1/4" stainless steel screws. 15 year warranty on all devices.

## **2.11 WEATHERSTRIPPING MATERIALS**

### **A. Door Sill Weather-stripping:**

1. Weather-stripping shall consist of a 1/8-inch thick by 1-3/8-inch-high neoprene strip housed in an extruded, anodized aluminum housing approximately 0.070-inch thick by 1-1/4-inches high by the full width of the door and attached to the door with countersunk screws.

## **2.12 FINISHES**

### **A. Hardware shall receive the following finishes conforming to BHMA A156.18, as follows:**

1. Hinges, Locksets and Latch Sets: Satin stainless steel, BHMA Code 630
2. Closers, sprayed, matching locksets and latch sets.

### **B. Aluminum hardware items shall be anodized to an Architectural Class I natural finish not less than 0.70" thick conforming to AA DAF-45 (designation AA M21 C22 A31).**

## **2.13 PANIC EXIT DEVICES**

### **A. Panic bar exit devices shall conform to BHMA a156.3, Grade 1.**

### **B. All exit devices shall be touch bar design with smooth operation and be operative over 2/3 of the door's clear opening.**

### **C. All springs shall be stainless steel throughout.**

### **D. Chassis shall be mounted unit construction.**

### **E. Rail assembly shall be heavy gauge steel.**

### **F. Latchbolt shall be stainless steel with a 3/4-inch throw,**

### **G. Non-handed, center hub.**

### **H. Finish to match the balance of the door hardware.**

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

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A. Hardware shall be installed and adjusted in accordance with the hardware manufacturer's printed instructions and to template dimensions.

B. Temporary-construction cores shall be furnished, installed, and maintained in locks during construction and removed when directed.

### **3.02 HARDWARE LOCATION**

A. Hardware shall be located in accordance with SDOI SDI-100, Table V, except when template dimensions and multiple-item installations require alternate locations.

### **3.03 HARDWARE SCHEDULE**

As noted on drawings.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 80 00**

#### **GLAZING**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Glass, glazing accessories and glazing for openings where shown.

##### **1.02 REFERENCES**

- A. ASTM C1036: Standard Specification for Flat Glass.
- B. ANSI Z97.1: Safety Glazing Material Used in Buildings.
- C. FEMA Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings
- D. FEMA Technical Bulletin 6: Requirements for Dry Floodproofed Below-Grade Parking Areas Under Non-Residential and Mixed-Use Buildings
- E. FEMA Technical Bulletin 7: Wet Floodproofing Requirements
- F. ASCE 24: Flood Resistant Design and Construction

##### **1.03 SUBMITTALS**

- A. Submit manufacturer's data for review.
- B. For glazing within or below the base flood elevation, submit product data for all glazing materials, including flood-resistant and impact-resistant properties. Provide manufacturer's certifications that all glazing complies with FEMA and NFIP requirements for flood resistance and impact resistance.

##### **1.04 QUALITY ASSURANCE**

- A. Manufacturer's label showing name, strength, thickness, and quality must appear on each piece of glass.
  - 1. Remove labels at time of glazing from insulating glass units.

## **1.05 WARRANTY**

- A. Provide manufacturers 10 year warranty for insulating glass units.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Vitro Glass Industries, Carlisle, PA 17013.
- B. Approved substitution.

### **2.02 MATERIALS**

- A. Tempered Glass: Clear float, 1/4" thick, meeting requirements of ASTM C 1036 and ANSI Z 97.1-1975.
- B. Clear Glass: 1/8" or 1/4" thick float glass meeting requirements of ASTM C 1036.
- C. Insulating Glass Units: Shall consist of one light of 1/4" thick tinted glass on the exterior and one light of 1/4" clear glass with Low-E coating on the interior, separated by a 1/2" spacer filled with moisture absorbing desiccant space between lights hermetically sealed using double sealed organic sealants. Corners fused.
  - 1. Exterior glass layer: Solarcool (2) Pacifica.
  - 2. Interior glass layer: Clear glass. Solarban 60 (3) Solar Control Low-E.
- D. Glazing Compounds, Setting Blocks, Gaskets: As recommended by frame and glass manufacturer.
- E. See section 08 88 56 – Ballistic Resistant Glazing for bullet resistant glazing.
- F. Provide blackout spandrel film, for use with glazing in elevator shafts.
- G. For Flood Resistant Glazing within or below the base flood elevation:
  - 1. Use laminated safety glass or other impact-resistant glazing that meets or exceeds the requirements for flood-resistant construction as per ASCE 24.
  - 2. Ensure glazing materials are designed to resist hydrostatic pressure and debris impact during flooding events.
  - 3. Use flood-resistant sealants and gaskets compatible with glazing materials to ensure watertight installation.
  - 4. Sealants and gaskets should be designed to maintain their integrity under

- prolonged exposure to water and pressure.
5. Use window and door systems that are specifically designed to be watertight and capable of withstanding hydrostatic pressure.
  6. Systems should include reinforced frames and impact-resistant glass.
  7. Use corrosion-resistant clips and stops to securely hold glazing in place and prevent displacement under flood conditions, of material compatible with the frame.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Comply with manufacturer's recommendations for glazing in materials and installation.
- B. Replace sheets which are damaged prior to time of acceptance.
- C. For glazing within or below base flood elevation;
  1. Install glazing materials in accordance with the manufacturer's instructions and FEMA/NFIP guidelines to ensure durability and flood resistance. Ensure proper alignment, sealing, and anchoring of all components during installation.
  2. Ensure all glazing installed below the base flood elevation (BFE) is watertight and capable of withstanding hydrostatic pressure. Apply flood-resistant sealants around all glazing perimeters and frame connections to prevent water ingress.
  3. Ensure all glazing materials meet the impact resistance requirements specified by FEMA and ASCE 24 to resist debris impact during flood events.
  4. Perform watertightness tests on installed glazing to confirm proper sealing and resistance to hydrostatic pressure. Conduct impact resistance tests on glazing to verify compliance with FEMA and NFIP standards.

### **3.02 CLEANING**

- A. Clean, wash, and polish both surfaces upon completion of the building.

**END OF SECTION**

## **DIVISION 8 – DOORS AND WINDOWS**

### **SECTION 08 88 56**

#### **BALLISTICS RESISTANT GLAZING**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Bullet Resistant rated glass, glazing accessories and glazing for openings where shown.

###### **1.02 SUBMITTALS**

A. Manufacturer's data for review.

B. Certificates of compliance from manufacturer attesting that glass and glazing comply with requirements, or manufacturer's permanent label designating type and thickness of glass provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

C. Product test listings from a qualified testing agency indicating bullet resistant glass complies with requirements.

###### **1.03 GUARANTEE**

A. Provide manufacturer's 5 year warranty for bullet resistant glass.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURERS**

A. McGrory Glass, 1400 Grandview Avenue, Paulsboro, NJ 08066

B. Total Security Solutions, Fowlerville, MI 48836

C. Approved substitution.

###### **2.02 MATERIALS**

A. Bullet Resistant Glass: GCP 1250, bullet and fire resistant glazing, nom. 1 1/4"

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thick. Complying with UL 752 high powered small arms (HPSA) level 3 performance. Multi-ply assembly of 1/4" glass, .05 urethane film, 1/8" polycarbonate, .025 urethane film, 3/8" polycarbonate, .025 urethane film, 1/8" polycarbonate, .05 urethane film, 1/4" glass. All edges of shall be filed, sanded after cutting to remove rough edges and then polished until "water clear" transparent. All through holes for fasteners shall be 3/8" in diameter and be drilled clean. Chipped edges at through-hole exit points are not acceptable. Provide fire resistance assembly where required.

B. Frame: Prime painted steel non-ricochet hollow metal, fixed frame. Complying with UL 9, UL 10B, UL 10C, and UL 1784, for min. fire resistance rating as scheduled. Finish color to be manufacturer's standard range of finish colors, basis of design is white.

C. Glazing compounds, setting blocks, gaskets as recommended by manufacturer. Use closed cell neoprene for gasketing.

D. See section 08 80 00 – Glazing, for window film tint for exterior applications.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. Comply with manufacturer's recommendations for glazing in materials and installation.

B. Replace sheets which are damaged prior to time of acceptance.

### **3.02 CLEANING**

A. Clean, wash and polish both glass surfaces upon completion of the construction.

**END OF SECTION**

## DIVISION 8 – DOORS AND WINDOWS

### SECTION 08 95 43

#### FOUNDATION FLOOD VENTS

##### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

A. Flood vents.

##### 1.02 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 06 10 00 - Rough Carpentry.

C. Section 07 92 00 – Sealants and Caulking.

D. Section 08 35 00 – Bifold Doors.

##### 1.03 REFERENCES

A. ASCE/SEI 24-14, Flood Resistant Design and Construction.

B. FEMA, 44-CFR, Part 59-60 and 60.3 National Flood Insurance Program (NFIP).

C. FEMA/FIA-TB 1-2008, Openings in Foundation Walls and Walls of Enclosures for Buildings Located in Special Flood Hazard Areas.

D. International Code Council ICC-ES Acceptance Criteria for Automatic Foundation Flood Vents (AC-364). October 2007

E. Federal Emergency Management Association's MEMO W-08086, October 2008

##### 1.04 DESIGN / PERFORMANCE REQUIREMENTS

A. USA Flood Vents are Engineered Openings comply with the following:

1. Certifications:

a. International Code Council - Evaluation Service Report (ESR-3907) including Florida Building Code Supplement.

2. Compliance:

a. Intertek/ATI CCRR-0239 Certification: Meets requirements of the ICC-ES-AC364 CCRR-239.

- b. FEMA Technical Bulletin 1: Openings in Foundation Walls and Walls of Enclosures (TB-1).
- c. NFIP Bulletin W-08086.
- d. NFIP Flood Insurance Manual.
- e. American Society of Civil Engineers: Flood Resistant Design and Construction (ASCE 24-14).
- f. International Residential Codes (IRC)
- g. International Building Codes (IBC)

### **1.05 SUBMITTALS**

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment and periodic cleaning and maintenance of all components.

### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum 5 years documented experience.
- B. Installer Qualifications: Installer with experience on projects of a similar size and scope with similar installation conditions.

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

- A. Deliver and store materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
  - B. Store products in clean, dry area indoors until ready for installation. Store materials in accordance with manufacturer's instructions.
  - C. Protect materials and finish from damage during handling and installation.
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## **1.08 SEQUENCING**

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## **1.09 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. Limited Lifetime warranty for manufactured defects excluding finish.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Smart Vent, Mount Royal, NJ 08061
- B. Approved substitution.

### **2.02 FLOOD VENTS**

- A. General: Operation of vent is based on hydrostatic pressure.
    - 1. Engineered openings are designed to provide the equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters.
    - 2. A minimum of two bi-directional vents are required for enclosed flood exposed area and should be installed on opposite or adjacent walls.
    - 3. Frames are designed for installation in masonry, concrete, or framed walls, stud walls, garage doors and metal panels. FEMA approved.
  - B. Insulated Smart Flood Vent (Wall): 1540-520. Vent size 16" W x 8" H x 3" D, rough opening size of 16.25" W x 8.25"H. 316L marine grade stainless steel. Vent door is latched closed until it comes in contact with flood water, internal
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floats permit automatic drainage. 2" insulated core with an R-value of 8.34. Finish to be selected from standard range of colors, stainless steel.

C. Insulated Smart Flood Vent (Garage Door): 1540-524. Vent size 16" W x 8" H x 3" D, rough opening size of 16" W x 8"H. 316L marine grade stainless steel. Vent door is latched closed until it comes in contact with flood water, internal floats permit automatic drainage. 2" insulated core with an R-value of 8.34. Finish to be selected from standard range of colors, stainless steel.

D. Accessories:

1. Fasteners:

a. Stainless Steel concrete anchors, four for each vent, at masonry or concrete openings.

b. Stainless Steel screws, four for each vent, wood framed openings.

2. Sealant: Sashco Lexcel elastic sealant for wood, masonry or concrete surfaces.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

A. Do not begin installation until substrates have been properly prepared.

B. Verify vent locations are ready to receive work, and dimensions are as indicated or as instructed by the manufacturer.

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

### **3.02 PREPARATION**

A. Clean surfaces thoroughly prior to installation.

B. Review and coordinate with the Drawings, and related items that are to be embedded in concrete and masonry.

C. Verify that no obstructions exist that will interfere with the proper operation of the vents.

D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install vents in at least two different walls spaced evenly around foundation perimeter, and located a maximum of 12 inches above grade to bottom of vent.
- C. Install vents plumb, level, square, true to line, and rigid.
- D. Attach vents securely in place using fasteners supplied or approved by manufacturer.
- E. Separate incompatible materials to prevent galvanic corrosion.
- F. Caulk and seal around penetrations to seal voids in accordance with manufacturer's instructions.

### **3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## **DIVISION 9 – FINISHES**

### **SECTION 09 21 16**

#### **GYP SUM BOARD ASSEMBLIES**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Gypsum wallboard over steel stud partitions
- B. Sound-deadening gypsum wall board over studs where shown.
- C. Only gypsum wall board products manufactured in North America shall be used on this project.

##### **1.02 RELATED SECTIONS**

- A. Refer to Section 07 92 19 – Acoustic Sealants for installation requirements for all acoustically rated walls.

##### **1.03 SUBMITTALS**

- A. The following manufacturer's catalog data shall be submitted in accordance with Section 01 33 00, "Submittals," in sufficient detail to show full compliance with the specification:

- 1. Gypsum Wallboard.
- 2. Joint Tapes.
- 3. Compounds.
- 4. Accessories, Trims and Control Joint Materials.

##### **1.04 DELIVERY, HANDLING, AND STORAGE**

- A. Materials shall be protected from weather, soil, and damage during delivery, while stored, and during construction.
- B. Materials shall be delivered in the manufacturer's original packages; containers or bundles shall bear the brand name and the name of the manufacturer.
- C. Materials shall be stored in dry, weather-tight, and properly ventilated areas.
- D. Gypsum wallboard shall be neatly stacked flat, with care taken to avoid sagging

or damage to edges, ends, and surfaces.

E. Wallboard delivered to the building shall be kept protected and banded with midpoint slat spaces of 2 by 1/2-inch (50 by 13 millimeter) material extended full width between each layer of gypsum wallboard.

## **1.06 PROJECT/SITE CONDITIONS**

A. Environmental Requirements: Temperature- A temperature of not less than 55 degrees F (13 degrees C) shall be provided in areas of work during the application of the materials and shall be maintained until the joint treatment compounds are dry.

B. Ventilation: Ventilation shall be provided to eliminate moisture within the building.

C. Moisture Control:

1. Gypsum wallboard installation and joint treatment shall be accomplished in a uniform temperature with sufficient ventilation to ensure that throughout the application period the wallboard moisture does not exceed 8 percent.
2. Wallboard that has moisture content in excess of 8 percent shall not be installed.

D. Field Measurements: Field measurements shall be taken before installation of materials to verify the indicated dimensions and to ensure proper fit of the work.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. United States Gypsum Corporation, Chicago, IL 60661.

B. PABCO Building Products, LLC., Newark, CA 94560

C. Approved substitution.

### **2.02 WALLBOARD MATERIALS**

A. General Requirements for Wallboard: Conform to ASTM C 1396 of grade and form as specified for each type of board. Wallboard shall be 48-inches (1200 millimeter) wide, shall have thickness as indicated, and a maximum practical length for end use.

B. Ceiling: 5/8-inch (15.9 millimeter) thick, regular gypsum wallboard.

C. Regular Gypsum Wallboard: Regular gypsum wallboard shall conform to ASTM C 1396, 48-inches wide and at least 5/8 inch thick, tapered edges, Type-X.

D. Sound-deadening Gypsum Wallboard:

1. QuietRock 530 as manufactured by PABCO., high performance sound damping gypsum panel. UL fire-rated, STC-rated, shear-rated, and impact-resistant.
2. Conforms to ASRM C1396, - Federal Specification SS-L-30D Grade X.
3. Furnish battens and acoustic caulking as necessary to seal drywall seams, fasteners and wall penetrations as specified in Section 07929.
4. Install all joint materials and accessories as required by manufacturer assembly details to achieve STC rating indicated on the drawings.

E. Water-Resistant Wall Board:

1. Water-resistant gypsum wall board shall conform to ASTM C 630 water-repellent-treated core, mold resistant, tapered edge, at least 5/8-inch thick, Type-X.
  1. USG Fiberock Interior Panel or approved substitution.
  2. STC-rated wall: Quietrock 530.
  3. Install in all janitorial rooms and in walls containing plumbing and wet services.

F. Joint Materials:

1. Joint tape shall be plain or perforated material conforming to ASTM C 475, Type II, Styles 1 and 2.
2. Joint compound shall be an adhesive, with fillers, conforming to ASTM C 475, Type I, Style 3.

G. Metal Fasteners:

1. Screws shall be steel, self-tapping drywall type, bugle head, self-drilling point; the length shall be as recommended by the drywall manufacturer for the type of system being installed.

H. Metal Accessories and Trim:

1. Corner beads shall be formed to an angle of 90 degrees and shall be zinc-coated steel not lighter than 30-gage (0.40 millimeter) before coating with wings not less than 7/8-inch (23 millimeter) wide and perforated for nails and cement treatment. Zinc-coated steel shall conform to SMACNA-02,

- SMACNA-02A, and AASHTO M 111, Type I, Class C.
2. Casing trim shall be 28-gage (0.47 millimeter) nominal thickness, hot-dip galvanized steel channel, depth as required for wallboard, with attached tape flange.

I. Control Joint Material:

1. Control joint material shall be one piece, 29-gage, ( 0.44 millimeter,) roll-formed zinc, formed 7/16-inch deep by 1/4-inch( 11.1 millimeter deep by 6.4 millimeter) wide with a perforated flange 7/8-inch ( 22.2 millimeter) wide on each side of the joint opening, with a protective plastic strip.
2. Caulking shall be as recommended by the drywall manufacturer.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Defective wall and ceiling surfaces shall be corrected prior to application of drywall materials.

### **3.02 ERECTION, INSTALLATION AND APPLICATION**

- A. Framing members to receive gypsum wallboard shall be straight, plumb, and true and spaced not to exceed the maximum spacing for the board thickness.
- B. Boards of maximum practical length shall be used to minimize the number of end joints. Edges of boards shall be butted together but shall not be forced.
- C. Joints shall be staggered and shall not be aligned with the edge of an opening nor positioned so that the corners of four boards will meet at a common point.
- D. All abutting ends or edge joints shall occur over solid bearing and shall be fitted neatly and accurately, with all end joints staggered. Wallboard shall be supported as recommended by the manufacturer, with additional framing at all cutouts and openings.
- E. Perimeter of ceilings shall be finished with an edge bead trim where ceiling abuts dissimilar wall materials.
- F. Wall Trim shall be applied to wall and accurately aligned with the finished ceiling. Ceiling board edges that adjoin walls shall be laid on the horizontal leg of the trim strip, and the space behind the junction shall be closed with a dust membrane. Membrane shall be applied in advance of the wallboard application.

G. Exposed corners and edges and the perimeter of door, window, and borrowed-light frames shall be finished with the specified metal trim.

H. Tolerance and Alignment: Finished wallboard application shall be plumb and true, with all joints aligned to within a 1/16-inch (1.6 millimeter) tolerance and with all surfaces shimmed and aligned to a plane and even surface having a maximum variation of 1/8 inch in 8 feet (3 millimeter in 2438 millimeter.)

I. Fastening: Board shall be fastened with [power-driven, phillips-head screws at a maximum spacing of 12 inches (300 millimeter) on center in the field of the board and at 8 inches (200 millimeter) on center at edges and along abutting ends.

J. Ceiling and wall control joints fastened securely in place shall be provided at spacing not to exceed 30 feet in each direction.

K. Trim: Edges of exposed drywall shall be trimmed with the specified metal bead.

L. Framed Openings: Support members shall be provided at ceiling openings as required for access panels, recessed lighting fixtures, and heating and ventilating ducts.

M. Joint Finishing:

1. Joints between wallboard panels and joints at metal trim shall be reinforced with joint tape and embedding-type joint compound and concealed with at least two applications of finishing compound in accordance with the printed instructions of the manufacturer of the gypsum wallboard. Screw depressions shall be filled with at least three coats of joint compound. Flanges at corner beads, edge trim, and control joints shall be concealed with at least two applications of joint compound, feathered and sanded smooth.
2. Joint and screw-depression treatment shall be accomplished after wallboard is in place. A minimum of 24 hours' drying time shall be allowed between each coat. Where necessary, the last coating shall be sanded lightly with 2/0 sandpaper to leave a smooth finish flush with the paper face of the wallboard.
3. Control joints shall be concealed with three coats of joint cement. After the second coating has dried, a third coating shall be applied very thin to a smooth surface and feathered out 12 to 16 inches (300 to 400 millimeters) on both sides of the joint. If necessary, the joints, when dry, shall be sanded lightly with 2/0 sandpaper to leave a smooth, flush surface. Care shall be taken not to scuff the paper surface of the wallboard when sandpapering the cement. Water content of the finish bedding cement coat shall be in strict accordance with the manufacturer's specifications.

N. Installation of Gypsum Drywall Ceilings: Steel Framed Drywall Ceilings:

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Wallboard shall be applied and finished as specified and in accordance with the drywall manufacturer's written instructions for contact application.

O. Fixture Attachment: Provide wood mounting strips for cabinets and shelving as indicated. Mounting strip shall be braced and secured between studs; attachment bolts that extend through bracing, studs, and drywall shall be provided.

P. Steel Framed Drywall Partitions: Gypsum wallboard shall be applied and finished as specified and in accordance with the drywall manufacturer's written instructions.

Q. Surface Finishing:

1. Surface defects and damage shall be corrected to leave wallboard smooth, uniform in appearance, and ready to receive finish as specified in other sections of these specifications.
2. All control joints shall be properly and completely filled with the specified sealant.
3. Joints shall be sanded when dry after each application of joint compound. Final finish shall be uniformly smooth and flush with the paper face of the wallboard.
4. Surfaces of the work, and adjacent surfaces soiled as a result of this work shall be cleaned.

### **3.03 SOUND-DEADENING WALLBOARD INSTALLATION**

A. Comply with manufacturer's installation instructions to achieve specified STC rating.

B. Apply acoustic sealant to all rough-in boxes, penetrations, wall corners and perimeter joints including along floor.

C. Inside and outside corners shall be prepared with corner sealant prior to hanging wall board. Corner joints in wallboard assemblies shall be taped prior to finishing according to manufacturer's recommendations.

**END OF SECTION**

## **DIVISION 9 - FINISHES**

### **SECTION 09 30 13**

#### **CERAMIC TILE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Ceramic mosaic tile and trim pieces, grout and related accessories to be installed over interior walls and a concrete slab floor.

###### **1.02 REFERENCES**

A. ANSI A118.4: Latex-Portland Cement Mortar.

B. ANSI A118.6: Ceramic Tile Grouts.

C. ANSI A108.5: Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.

D. ANSI A108.10: Installation of Grout in Tile Work.

###### **1.03 SUBMITTALS**

A. Samples: Submit tile panels for review and color selection.

B. List of manufacturers and products for review.

###### **1.04 MAINTENANCE STOCK**

A. Upon completion of installation, deliver stock of maintenance material to Owner. Furnish full size units matching units installed, packaged with protective covering for storage, and identified with appropriate labels. Furnish an amount equal to 2.0% of amount installed for each color used.

###### **1.05 QUALITY ASSURANCE**

A. Installer must have in his possession a copy of the latest TCA Handbook for Ceramic Tile Installation.

## **1.06 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in manufacturer's original sealed containers.
  - 1. Labels legible and intact identifying brand name and contents.
  - 2. Tile cartons grade-sealed by manufacturer in accord with TCA 137.1.

## **1.07 JOB CONDITIONS**

- A. Environmental: Set and grout tile when ambient temperature is at least 50 degrees F (10 degrees C and rising) and for seven days after completion.
- B. Protection: Protect adjoining work surfaces before tile work begins.
- C. Provide adequate lighting.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Dal-Tile, Dallas, TX 75217.
- B. No substitutions.

### **2.02 MATERIALS**

- A. Restroom + Locker Room Accent Wall & Floor Tile:
  - 1. Conforming to TCA 137.1, recommended specifications for Ceramic Tile.
  - 2. Unglazed tile for accent walls, floors and base: Emerson collection. Color: Butter Pecan. Finish: Stepwise Technology for increased slip-resistance (floors only).
  - 3. Nominal size: 6" x 36" x 3/8", all-purpose edge. 2" x 2" mosaic for shower floor.
- B. Restroom + Locker Room Field Wall Tile:
  - 1. Conforming to TCA 137.1, recommended specifications for Ceramic Tile.
  - 2. Glazed tile for accent walls and base: Polaris collection. Color: Gloss White Rectangle.
  - 3. Nominal size: 10" x 14" x 3/8", all-purpose edge.
- D. Setting and Grout Materials:

1. Setting bed: Latex Portland cement mortar, ANSI A118.4.
2. Grout: Fungus and mildew resistant (TCA Formula MRG-82), Summitville S-687.
3. Water: Potable.
4. Grout color as selected to coordinate with tile colors. Basis of design is white.

E. Miscellaneous:

1. Silicone rubber grout/sealant: FS TT-S-001543A as manufactured by General Electric or approved substitution.

F. Thresholds:

1. Provide to adjust between tile and other floor finishes.
2. Material: Aluminum sloped transition.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

A. Examine surfaces to receive setting beds before tile installation begins for the following:

1. Defects or conditions adversely affecting quality and execution of tile installation.
2. Deviations beyond allowable tolerance of surfaces to receive tile.

B. Condition of surfaces to receive tile:

1. Surfaces to be firm, dry, clean, and free of oily or waxy films.
2. Mechanical work in tile to be installed prior to proceeding with tile work.

C. Do not proceed with installation work until satisfactory conditions are corrected.

### **3.02 INSTALLATION**

A. Tile over CMU walls, 4 1/4" x 4 1/4". TCA W202-07:

1. Bond coat: Dry set mortar - ANSI A118.1.
2. Grout: Fungus and mildew resistant.

B. Tile over gypsum wallboard on metal or wood studs, 4 1/4" x 4 1/4". TCA W243-07:

1. Bond Coat: Dry set mortar – ANSI A118.1.
2. Grout: Fungus and mildew resistant.

C. Tile over concrete floor slabs. TCA F113-07:

1. Bond coat: Dry set mortar - ANSI A118.1.
2. Grout: Fungus and mildew resistant.

D. Silicone rubber grout/sealant: Comply with grout/sealant manufacturer's instruction. Seal penetrations thru tile surfaces at pipes, fittings.

### **3.03 CLEANING**

A. Clean per manufacturer's and TCA handbook instructions.

### **3.04 PROTECTION**

A. Protect walls and corners from construction traffic. Replace damaged tiles.

**END OF SECTION**

## **DIVISION 9 - FINISHES**

### **SECTION 09 51 13**

#### **ACOUSTICAL PANEL CEILINGS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Acoustical mineral fiber lay-in panel ceilings, for use with an exposed tee grid suspension system.

###### **1.02 QUALITY ASSURANCE**

A. Applicable publications by Acoustical and Insulating Materials Association (AIMA), including "Performance Data, Architectural Acoustical Materials."

###### **1.03 SUBMITTALS**

A. Submit one set of 12" square samples of qualifying acoustical units.

B. Architect's review will be for color and texture only. Compliance with other requirements is exclusive responsibility of Contractor.

###### **1.04 MAINTENANCE STOCK**

A. Upon completion of installation, deliver stock of maintenance material to Owner. Furnish full size units matching units installed, packaged with protective covering for storage, and identified with appropriate labels. Furnish an amount equal to 1.0% of amount installed.

###### **1.05 JOB CONDITIONS**

A. Space Enclosure: Do not install acoustical ceilings until work in the space has been completed and is dry.

B. Temperature Range: 60 degrees to 85 degrees F., relative humidity no more than 70%.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Armstrong, Malvern, PA 19355.
- B. Approved substitution.

### **2.02 ACOUSTICAL PANELS**

A. AC-L #1: 24"x24" tegular edge design, 5/8" nominal thickness, with factory applied white latex face. Approximate values NRC 0.55, R-value at 75 F. = 1.50, Armstrong Cortega.

- 1. See Section 09 53 00, Acoustical Suspension System Assemblies, for the specified suspension system to be used with this acoustical panel.

B. AC-L #2: 24"x24" square edge design, 5/8" nominal thickness, mold and mildew resistant, perforated face. Approximate NRC 0.55. Armstrong Ceramaguard Fine Fissured.

- 1. See Section 09 53 00, Acoustical Suspension System Assemblies, for the specified suspension system to be used with this acoustical panel.

C. AC-L #3: 24"x24" square edge design, smooth texture, electrogalvanized steel – 14 gauge galvanized steel with post production powder coated paint finish – White. Perforated. Screw In Concealed Locking (tested to withstand 960 – 3100 lbs of force). Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, perforated with fiberglass infill item #8200100 – 0.80. Flame Spread: ASTM E 1264; Class A (FM). Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance (perforated – 0.61). Standard Dimensional Stability. Armstrong Metalworks SecureLock Plus.

- 1. See Section 09 53 00, Acoustical Suspension System Assemblies, for the specified suspension system to be used with this acoustical panel.
- 2. Fiberglass infill; Item #820-01-00.
- 3. Access Door Panel; Item #5949

## **PART 3 - EXECUTION**

### **3.01 PREPARATION WORK**

A. Installer must examine conditions under which work is to be performed and notify Contractor of unsatisfactory conditions. Do not proceed with work until unsatisfactory

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conditions have been corrected.

### **3.02 INSTALLATION**

- A. General: Install materials in accord with manufacturer's printed instructions, and comply with governing regulations, and industry standards applicable to the work.
- B. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members.
  - 1. Scribe and cut panels to fit accurately at penetrations.
- C. Comply with requirements for light fixture protection.
- D. Cleaning and Protection: Clean exposed surfaces of acoustical ceiling, 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 or repaired.

**END OF SECTION**

## **DIVISION 9 - FINISHES**

### **SECTION 09 53 00**

#### **ACOUSTICAL CEILING SUSPENSION ASSEMBLIES**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Exposed suspension system for use with acoustical lay-in panels.

###### **1.02 REFERENCES**

- A. Applicable publications by Acoustical and Insulating Materials Association (AIMA), including "Performance Data, Architectural Acoustical Materials".
- B. ASTM A641: Zinc-Coated (Galvanized Carbon Steel Wire.
- C. ASTM C635: Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- D. ASTM C636: Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

###### **1.03 SUBMITTALS**

- A. Submit one set of 12" long samples of exposed runner and edge molding, for each color selected.
- B. Architect's review will be for color and texture only. Compliance with other requirements is exclusive responsibility of Contractor.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. Armstrong Contract Interiors, Lancaster, PA, 17604
- B. USG Interiors, LLC, Chicago, IL, 60661
- B. Approved substitution.

## 2.02 CEILING SUSPENSION MATERIALS

A. AC-L #1: Comply with ASTM C 635, as applicable to type of suspension required for type of ceiling units indicated. Coordinate with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment. Provide intermediate duty system, direct hung, equal to Armstrong Prelude ML 15/16" exposed grid tee system.

1. See Section 09 51 13, Acoustical Lay-in Panel Ceilings, for specified ceiling panel to be used with this suspension system.

B. AC-L #2: Armstrong AL Prelude Plus aluminum light duty exposed grid tee system.

1. See Section 09 51 13, Acoustical Lay-in Panel Ceilings, for specified ceiling panel to be used with this suspension system.

C. AC-L #3: Metal or stainless steel of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Armstrong's recommended suspension system for SecureLock Plus.

1. See Section 09 51 13, Acoustical Panel Ceilings, for specified ceiling panel to be used with this suspension system.
2. SecureLock Plus Hold Down Clips; Item #5595
3. C Channel; 14 gauge, Item #5397WH
4. Midspan Strut; Item #5593WH
5. Z Clips; 14 gauge, Item #5599

D. Attachment Devices: Hanger wires of galvanized carbon steel, ASTM A 641, soft temper, pre-stretched, not less than 12 gauge (0.106").

E. Exposed Suspension System: Provide uniform factory-applied baked enamel finish on exposed surfaces including moldings, trim and accessories.

F. Edge Moldings: Manufacturer's standard angle molding for edges and penetrations of ceiling, with single flange exposed, baked enamel finish.

G. Provide hold down clips when panels weigh less than one pound per square foot.

## PART 3 - EXECUTION

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### **3.01 PREPARATION**

- A. Installer must examine conditions under which work is to be performed and notify Contractor of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Measure each ceiling area and establish layout of units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders.

### **3.02 INSTALLATION**

- A. General: Install materials in accord with manufacturer's printed instructions, and comply with governing regulations, fire resistance rating requirements, and industry standards applicable to the work.
- B. Install suspension systems to comply with ASTM C 636, with hangers supported from building structural members. Locate hangers near each end and space 4'-0" along each carrying channel or direct hung runners.
  - 1. Secure wire hangers by looping and wire-tying, either directly to structure or to other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperature.
- C. Install edge moldings at edges of each acoustical ceiling area, and at locations where edge of units would otherwise be exposed.
  - 1. Secure moldings to building by fastening with screw-anchors into substrate, through holes drilled in vertical leg. Space holes not more than 3" from each end and not more than 16" apart.
  - 2. Level moldings with ceiling suspension system, to a level tolerance of 1/8" in 12'-0".
  - 3. Miter corners of moldings accurately to provide hairline joints, securely connected to prevent dislocation.
  - 4. Cope exposed flanges of intersecting suspension system members, so that flange faces will be flush (cope flange of member supported by other member).

**END OF SECTION**

**DIVISION 9 – FINISHES**  
**SECTION 09 65 00**  
**RESILIENT LVT FLOORING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Resilient flooring systems.
- B. Rubber base.

**1.02 REFERENCES**

- A. All products specified herein shall meet the requirements of the following:
  - 1. ASTM F 970: Static Load Limit.
  - 2. FS SS-W-40: Wall Base: Rubber and Vinyl Plastic.
  - 3. ASTM E 648 Flooring Radiant Panel Critical Radiant Flux 0.45 watts/cm<sup>2</sup> or more, Class 1, (Passes).
  - 4. ASTM E662 Smoke Chamber Specific Optical Smoke Density 450 or less, (Passes)
  - 5. ASTM F1700: Standard Specification for Solid Vinyl Tile.

**1.03 SUBMITTALS**

- A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions
- B. Samples for review and color selection.

**1.04 WARRANTY**

- A. Provide written warranty for materials and workmanship used in floor covering work against defects for a period of 20 years from date of Substantial Completion, agreeing to repair or replace resilient flooring that fails within the warranty period.

**1.05 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original containers with seals unbroken and labels intact.
- B. Handle and store materials in accord with the manufacturer's directions.
- C. Store materials in a clean, dry, enclosed space off the ground, protected from

harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing.

## **1.06 JOB CONDITIONS**

A. Maintain good ventilation and a temperature of at least 70° F in material storage areas, and in rooms where floor coverings are to be laid for 48 hours before, during and 48 hours after installation. Maintain a minimum temperature of 55 F. thereafter.

B. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.

C. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond, moisture tests and pH test.

## **1.07 MAINTENANCE STOCK**

A. Replacement Material: One box for every 50 boxes, or two percent replacement stock minimum of flooring type installed of each type, color and pattern. Furnish extra materials from same production run as products installed. Package with protective covering for storage and identify with appropriate labels.

## **1.08 QUALITY ASSURANCE**

A. Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.

B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this project, and adheres strictly to manufacturer's installation guidelines.

C. Pre-installation Meeting: Conduct an on-site pre-installation meeting to verify project requirements, substrate conditions, seam layout, manufacturer's installation instructions and manufacturer's warranty requirements.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURER**

A. AVA by Novalis, Mooresville, NC 28117

B. Patcraft, a Division of Shaw Inc., Dalton, GA 30721

C. Tredsafe Ltd, Baltimore, MD 21224.

D. Tarkett, Inc., Solon, OH 44139

E. Approved substitution.

## **2.02 MATERIALS**

A. Luxury Vinyl Tile Flooring: ASTM F 1700, Class III, Type B. Overall thickness 0.098 in., Wear layer thickness 0.022 in., Static Load Limit passing ASTM F970.

1. Approved substitution.
2. Allow for three (3) main colors:
  - a. Flooring Style #1: Patcraft – Local Reserve – Reed V2
  - b. Flooring Style #2: Patcraft – Local Reserve – Cashew
  - c. Flooring Style #3: Patcraft – Local Reserve – Iron V2

B. Rubber Base:

1. Base typical of all rooms. Height 4", 1/4" thick, Co-extruded Thermoplastic Rubber Sculptured Wall Base, continuous rolls. Community – Sculpted Wall Base Type TP. Profile: Franklin. Color to be selected from standard range of colors, 2082 Smoke.
2. Base for corridors, only. Height 4", 1/4" thick, Co-extruded Thermoplastic Rubber Sculptured Wall Base, continuous rolls. Community – Suburban Wall Base, 4.0" cove with filler rod installed behind toe. Color to be selected from standard range of colors.
  - a. 2082 Smoke
  - b. 2058 Baroque, against wall protection sheet (antique white). See section 10 26 10 – Vinyl Wall Protection.

C. Adhesive: Adhesive for flooring and wall base shall be as recommended by the flooring manufacturer.

D. Weld Rods: Select from patterned or solid designs furnished by sheet vinyl manufacturer.

E. Accessories: Furnish rubber transition strips at changes of sheet flooring systems and as otherwise directed by Architect.

1. Linear edges: DT-024.
2. Radiused edges: DT-037.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION/VERIFICATION OF CONDITIONS**

A. The Contractor shall verify that site conditions are in agreement with the design package and shall report all conditions that will prevent a proper installation.

### **3.02 SURFACE PREPARATION**

A. Flooring shall be in a true, level plane, except where indicated as sloped. Before any work under this section is begun, all defects such as rough or scaling concrete, low spots, high spots, and uneven surfaces shall have been corrected, and all damaged portions of concrete slabs shall have been repaired as recommended by the flooring manufacturer. Concrete curing compounds, other than the type that does not adversely affect adhesion, shall be entirely removed from the slabs.

### **3.03 CONCRETE TESTING**

A. Moisture Test: test suitability of the concrete sub-floor for receiving the resilient flooring with regard to moisture content shall be determined by a moisture test as recommended by the flooring manufacturer.

B. pH Test: test concrete slab to confirm compliance with manufacturer's requirements. All test results shall be documented and retained.

### **3.04 INSTALLATION**

A. Install flooring in strict accordance with the latest edition of Armstrong Flooring Guaranteed Installation Systems manual, F-5061, or installation instructions of approved manufacturer. Failure to comply may result in voiding the manufacturer's warranty.

B. Flooring shall be installed with adhesive in accordance with the manufacturer's installation instructions. Lines and joints shall be kept square, symmetrical, tight, and even. Each floor shall be in a true, level plane, except where indicated as sloped. Flooring shall be cut to, fitted around, and scribed to all permanent fixtures, built-in furniture and cabinets, pipes, and outlets.

### **3.05 INSTALLATION OF RUBBER BASE**

A. Wall base shall be installed with adhesive in accordance with the manufacturer's instructions. Base joints shall be tight and base shall be even with adjacent resilient flooring.

### **3.06 PROTECTION**

A. From the time of installation until acceptance, flooring shall be protected from damage. Flooring which becomes damaged, loose, broken, or curled shall be removed and replaced.

**END OF SECTION**

## **DIVISION 9 – FINISHES**

### **SECTION 09 65 16**

#### **RUBBER SHEET FLOORING**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Sheet rubber flooring systems.

###### **1.02 REFERENCES**

- A. All products specified herein shall meet the requirements of the following:
  1. ASTM F 970: Static Load Limit.
  2. ASTM D 412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers: Tension
  3. ASTM E 648 Flooring Radiant Panel Critical Radiant Flux 0.45 watts/cm<sup>2</sup> or more, Class 1, (Passes).
  4. ASTM E662 Smoke Chamber Specific Optical Smoke Density 450 or less, (Passes).

###### **1.03 SUBMITTALS**

- A. Samples for review and color selection.
- B. Submit product data, including manufacturer's guide specifications product sheet, for specified products.
- C. Manufacturer's maintenance manuals.

###### **1.04 WARRANTY**

- A. Provide written warranty for materials and workmanship used in floor covering work against defects for a period of ten years from date of Substantial Completion.

###### **1.05 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original containers with seals unbroken and labels intact.
- B. Handle and store materials in accord with the manufacturer's directions.

###### **1.06 JOB CONDITIONS**

A. Maintain good ventilation and a temperature of at least 70 F. in material storage areas, and in rooms where floor coverings are to be laid for 48 hours before, during and 48 hours after installation. Maintain a minimum temperature of 55 F. thereafter.

## **1.07 MAINTENANCE STOCK**

A. Replacement Material: One box for every 50 boxes, or two percent replacement stock minimum of flooring.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURER**

A. ECOsurfaces, Lancaster, PA 17601.

B. Approved substitution.

### **2.02 MATERIALS**

1. A. Sheet Rubber System: Forest RX, Vulcanized Composition Rubber Flooring. Surface Layer of 2mm Heterogeneous Vinyl fusion bonded to the 5mm Vulcanized Composition Rubber base layer.

1. Overall thickness: 0.28 inches
2. Wear layer thickness: 0.08 inches
3. Roll width: 72 inches
4. Static load limit (ASTM F970): 1000 PSI
5. Coefficient of Friction (ASTM D2047): >0.6
6. Reaction to Fire (ASTM E648): Class 1
7. Abrasion Resistance (ASTM D3389): <1g, 1000 cycles
8. Color: Oiled Oak 2990.

B. Rubber Base: as specified in section 09 65 00 – Resilient LVT Flooring.

D. Adhesive: Adhesive for flooring shall be manufacturer's recommended adhesive: ES-90, E-Grip 95, or E-Grip 99. Utilize adhesive with zero-VOC.

E. Accessories: as specified in section 09 65 00 – Resilient LVT Flooring..

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION/VERIFICATION OF CONDITIONS**

A. The Contractor shall verify that site conditions are in agreement with the design package and shall report all conditions that will prevent a proper installation.

### **3.02 SURFACE PREPARATION**

A. Flooring shall be in a true, level plane, except where indicated as sloped. Before any work under this section is begun, all defects such as rough or scaling concrete, low spots, high spots, and uneven surfaces shall have been corrected, and all damaged portions of concrete slabs shall have been repaired as recommended by the flooring manufacturer. Concrete curing compounds, other than the type that does not adversely affect adhesion, shall be entirely removed from the slabs.

B. All saw cuts (control joints), cracks, indentations, and other non-moving joints in the concrete must be filled with an approved cementitious based patching compound.

C. Expansion joints in the concrete are designed to allow for expansion and contraction of the concrete. If a floor covering is installed over an expansion joint, it more than likely will fail in that area. Expansion joint covers designed for resilient floor coverings should be used.

### **3.03 MOISTURE TEST**

A. The suitability of the concrete sub-floor for receiving the resilient flooring with regard to moisture content shall be determined by a moisture test as recommended by the flooring manufacturer. Concrete shall have a minimum compressive strength of 3000 psi, be fully cured and permanently dry.

### **3.04 INSTALLATION**

A. Dry-lay rolls to allow product to relax for a minimum of two hours.

B. Sheet flooring shall be installed with adhesive in accordance with the manufacturer's installation instructions. Lines and joints shall be kept square, symmetrical, tight, and even. Each floor shall be in a true, level plane, except where indicated as sloped. Flooring shall be cut to, fitted around, and scribed to all permanent fixtures, built-in furniture and cabinets, pipes, and outlets.

### **3.05 PROTECTION**

A. From the time of installation until acceptance, flooring shall be protected from damage. Flooring which becomes damaged, loose, broken, or curled shall be removed and replaced.

**END OF SECTION**

## **DIVISION 9 - FINISHES**

### **SECTION 09 66 00**

#### **TERRAZZO FLOORING**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Poured in place resinous matrix epoxy terrazzo flooring.
- B. Joint, edge, and termination strips.
- C. Accessories necessary for complete installation.

###### **1.02 REFERENCES**

- A. Comply with published standards of The National Terrazzo and Mosaic Association, Inc., Leesburg, VA 20176.
- B. Section 03 30 00 – CAST-IN PLACE CONCRETE
- C. Section 07 92 00 – SEALANTS AND CAULKING
- D. Section 09 21 16 – GYPSUM BOARD SYSTEMS

###### **1.03 PRODUCT DELIVERY AND STORAGE**

- A. Deliver materials in original containers with seals unbroken and labels intact.
- B. Store materials in dry protected area at a temperature between 55 degrees to 90 degrees Fahrenheit. Follow manufacturer's directions for additional storage considerations.

###### **1.04 QUALIFICATIONS**

- A. Epoxy flooring contractor certified by NTMA.
- B. Materials used in the floor surfacing shall be the products of a single manufacturer.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURER**

- A. Concord Terrazzo Company, Inc.; Charlotte, NC 28213.
- B. Approved substitution.

**2.02 MATERIALS**

- A. Primer: Only as recommended by the manufacturer.
- B. Epoxy resin binder mixed according to manufacturer's recommendation and tested without aggregate added. All specimens cured for 7 days at 75 degrees plus or minus 2 degrees Fahrenheit and 50% plus or minus 2% R.H. The product shall meet the following requirements:

Property	Test Method	Requirement
Hardness	ASTM D-2240 using Shore D Durometer	60-85
Tensile Strength	ASTM D-412 Specimen made using "C" die	3,000 psi Minimum
Compressive Strength	ASTM D-695 Specimen "B" cylinder	10,000 psi Minimum
Chemical Resistance	ASTM D-1308 seven days at room temperature by immersion method	No deleterious effects: Distilled Water Mineral Oil Isopropanol Ethanol 0.025 Detergent Solution 1% Soap Solution 10% Sodium Hydroxide 10% Hydrochloric Acid 30% Sulfuric Acid

- 1. Epoxy Resin mixed according to manufacturer's recommendations and blended with 3 volumes of Georgia White marble blended 60% #1 chip and 40% #0 chip, ground and grouted with epoxy resin according to 3.02 C-2. All specimens cured 7 days at 75 degrees plus or minus 2 degrees Fahrenheit and 50% plus or minus R.H. The finished epoxy terrazzo shall meet the following requirements:

Property	Test Method	Requirement
Flammability	ASTM D-635	Self-extinguishing, extent of

		burning .025 inches maximum.
Thermal Coefficient of Linear Expansion	ASTM-D-696	25 x 10 <sup>-6</sup> inches per inch per degree to 140 degrees Fahrenheit
Bond Strength	ACI Committee No. 403/503 Bulletin Title No.59-43 (Pages 1139-1141)	100% concrete failure minimum, with 300 PSI minimum tensile strength.

C. Marble Chips or Glass Aggregate:

1. Size: To conform with NTMA gradation standards.
2. Hardness according to ASTM C-24I Ha-10 minimum.
3. 24 hours absorption rate not to exceed 0.75 percent.
4. Chips shall contain no deleterious or foreign matter.
5. Dust content less than 1% by weight.
6. Finish to be selected by Architect from manufacturer's standard range of colors, Standard Light Brown Terrazzo #49.

D. Strips:

1. Stop and divider "L" strips: 16 gauge white alloy zinc with 1/4" top reveal.

E. Terrazzo Cleaner:

1. pH factor between 7 and 10 where applicable.
2. Biodegradable and phosphate free.

F. Sealer:

1. Acrylic or urethane terrazzo sealer as determined by the terrazzo manufacturer.
2. pH factor between 7 and 10, where applicable.
3. Shall not discolor or amber.
4. Flash Point: ASTM D-56, 80 degrees Fahrenheit minimum, where applicable.
5. Special stain and/or chemical resistant sealers are needed for certain areas such as resistance to iodine or Betadine.

## 2.03 MIXES

A. Terrazzo Selection:

1. Concord Terrazzo Sample to be determined based on 100% marble.

B. Proportions:

1. Epoxy Terrazzo Topping: In accordance with resin supplier's recommendations.

C. Mixing:

1. Terrazzo Topping: Charge and mix marble chips and epoxy resin in accordance with supplier's instructions.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

A. Examine areas to receive terrazzo for:

1. Defects in existing work that affect proper execution of terrazzo work.  
Note: Cracks in substrate will usually be transmitted through topping to surface. Flexible membrane over cracks shall be used to minimize chance of subfloor cracks transferring to the terrazzo surface.
2. Deviations beyond allowable tolerances for the concrete slab work.  
Note: Subfloor not to vary more than 1/4 inch from true plane in 10 feet. Epoxy thin-set terrazzo, as specified, is not intended to level substrate and will only follow the contour of the concrete slab. If for any reason the subcontractor questions the suitability of the substrate, any work required to eliminate nonconformity of subsurface specifications is the responsibility of others. Any materials used to correct nonconformity must be compatible with terrazzo system selected and be approved by the terrazzo material manufacturer.

B. Proceed with installation only when all defects have been corrected.

### **3.02 INSTALLATION**

A. Subfloor:

1. Prepare substrate to receive epoxy terrazzo in accordance with manufacturer's recommendations.
2. Substrate Crack Repair: Hairline cracks less than 1/16" width may be filled with neat epoxy resin. Treat cracks larger than 1/16" width as recommended in NTMA Technical Bulletin #111 "Crack Detailing and Joint Treatments for Thin Set Terrazzo", Detail #6. Route out all cracks larger than 1/16" width and fill with rigid epoxy. Apply Flexible Epoxy across the

crack a minimum width of 24 inches at a spread rate of 40-50 square feet per gallon to achieve 32-40 mils dry film thickness over the crack and allow to cure. Optional reinforcement: Imbed fiberglass scrim cloth into wet primer and saturate with additional Flexible Membrane. Alternatively, scrim cloth may be gently placed onto surface of tacky Flexible Membrane without pressing down into resin. Allow to cure.

a. Alternate to Step #2: If cracks are too numerous to treat individually, apply Flexible Epoxy over entire floor surface as a crack isolation membrane following procedure outlined in step #2. Refer also to NTMA Technical Bulletin #111 "Crack Detailing and Joint Treatments for Thin Set Terrazzo", Detail #5.

3. Install divider strips over all concrete joints as recommended in NTMA Technical Bulletin #111 "Crack Detailing and Joint Treatments for Thin Set Terrazzo", Details #1-#7. Divider strips must be bonded to joint edges for contraction joints (aka control joints/sawcuts) and isolation joints (aka expansion joints) in subfloor. For contraction joints, refer to Details #1-#3. For Isolation joints, refer to Detail #4. For Construction joints (aka cold joints), refer to Detail #7. For exposed contraction joints, fill with #1200 Joint Filler. Fill isolation joints with urethane sealant formulated for use in floor expansion joints supplied by others. Do not use prefabricated double divider strips filled with neoprene.
4. Install divider strips as shown on drawings.

B. Placing Terrazzo:

1. Prime subfloor in accordance with resin supplier's instructions. If required, install moisture vapor control material before other terrazzo system materials.
2. Place terrazzo mixture and trowel to a dense flat surface to top of divider strips.

C. Finishing:

1. Rough Grinding:
  - a. Grind with 24 or finer grit stones or with comparable diamond plates.
  - b. Follow initial grind with 80 or finer grit stones or with comparable diamond plates.
2. Grouting:
  - a. Cleanse floor with clean water and rinse.
  - b. Remove excess rinse water, dry, and apply epoxy grout, supplied by epoxy manufacturer, to fill voids.
3. Cure Grout.
  - a. Grout may be left on terrazzo until all heavy and messy work in project is completed.
4. Fine Grinding:

- a. Grind with 80 or finer grit stones or with comparable diamond plates until all grout is removed from surface. Certain matrix colors and aggregates may require grinding to a level higher than 120 grit for acceptable appearance.
- b. Upon completion, terrazzo shall reasonably match approved samples with overall uniform chip density.

### **3.03 CLEANING AND SEALING**

- A. Wash all surfaces with a neutral cleaner.
- B. Rinse with clean water and allow surface to dry.
- C. Apply sealer in accordance with manufacturer's directions. For ADA slip resistance requirement, use UL approved sealer supplied by others as necessary.

### **3.04 PROTECTION**

- A. Upon completion, the work shall be ready for final inspection and acceptance by the owner or his agent.
- B. The General Contractor shall protect the finished floor from the time that the terrazzo contractor completes the work.

**END OF SECTION**

## **DIVISION 9 – FINISHES**

### **SECTION 09 68 13**

#### **CARPETING**

##### **PART 1 – GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Carpet glued down and carpet installation accessories.

###### **1.02 QUALITY ASSURANCE**

- A. Comply with applicable provisions of latest edition of the following:
  - 1. ASTM D 1335: Test for Tuft Bind of Pile Floor Coverings.
  - 2. ASTM E 84: Surface Burning Characteristics of Building Materials.
  - 3. DOC FF 1–70: Standard Flammability Test for Soft Floor Materials.
  - 4. Carpet fire rated and certified in writing when laboratory tested per UL 992 and NBS tests.

###### **1.03 SUBMITTALS**

- A. Submit shop drawings, seaming plan, transition strip locations and types, coving details, and manufacturer's technical data, installation and maintenance instructions.
- B. Samples for review and color selection.
- C. Submit product data, including manufacturer's guide specifications product sheet, for specified products.
- D. Manufacturer's maintenance manuals.

###### **1.04 GUARANTEE**

- A. Contractor to provide his written guarantee as follows: "Materials and workmanship are guaranteed against defects for a period of one year from date of Substantial Completion".

###### **1.05 JOB CONDITIONS**

- A. Maintain good ventilation and a temperature of at least 70 degrees F. in material storage areas, and in rooms where floor coverings are to be laid for 48 hours before and

after laying. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to allow bond between adhesive and concrete. Concrete slabs should have moisture and pH readings that are within the specified tolerance of the adhesive to be used.

## **1.06 WARRANTY**

A. Provide manufacturer's warranty that agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

1. More than 10 percent face fiber loss, and edge raveling.
2. Dimensional instability.
3. Excess static discharge.
4. Loss of tuft-bind strength.
5. Delamination.
6. Where face fiber is 100 percent solution dyed, in ability to remove acid based stains.
7. Lack of colorfastness to atmospheric contaminants.

B. Warranty Period: 10-year Commercial Limited Warranty.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURER**

A. Patcraft, a Division of Shaw Inc., Dalton, GA 30721.

B. No substitutions.

### **2.02 MATERIALS**

A. Carpet: Gemscape, Modular, Solution Q Extreme Nylon filament with built-in high performance backing tile for direct glue down with the following minimum requirements. 24" x 24" tile.

1. Construction: Multi-Level Pattern Loop
2. Machine Gauge (Pitch): 1/10".
3. Stitches/Inch: 10
4. Tufted Yarn Weight/Square Yard: 16 ounces.
5. Pile Thickness: .118" Min.
6. Dye Method: 100% solution dyed.
7. Backing: Non-woven synthetic.
8. Secondary: Strataworx Tile.
9. Flammability: ASTM E 648 Class 1 (Glue Down).

- 10. Static Propensity: Less than 3.5 KV as tested under AATCC-134.
- 11. Smoke Density: ASTM E662 Less than 450.
- 12. CRI Green Label Plus: GLP2671.
- 13. Pill Test: Pass.
- 14. Allow for two (2) main colors:
  - a. Carpet 1: Inclusion Color I0553, Jade 00410. Installation pattern: quarter turn.
  - b. Carpet 2: Surface Striation I0552, Fluorite 00400. Installation pattern: quarter turn.

- B. Carpet Guard: Rubber, designed to overlap edges of floor covering to prevent loosening under traffic.
- C. Carpet Adhesive: Product formulated for the particular type of installation.
  - 1. Carpet adhesives shall have a VOC content of 50 g/L or less.
- D. Rubber Base: as specified in section 09 65 00.
- E. Transition strips: as specified in section 09 65 00.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Floor Surfaces: Clean of debris, complete dry, free from chemicals or solvents.
- B. Before installation, inspect for smoothness and level of floors to receive carpeting. Base surface must be free of holes or cracks wider than 1/16 inch. Smooth off rough spots. Apply leveling compound as required. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Install carpet in accord with manufacturer's latest printed instructions for direct cement application.
- D. Install carpet guard where carpet meets dissimilar flooring materials.

### **3.02 CLEAN UP**

- A. Vacuum clean using beater bar type sweeper, cut loose threads with scissors and remove spots with a suitable cleaner.
- B. Turn over usable scraps to Owner.

**END OF SECTION**

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## DIVISION 9 – FINISHES

### SECTION 09 91 00

#### PAINTS

##### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Paints and coatings for exterior and interior applications.
1. Material, labor, equipment and services necessary for, and incidental to, finishing and application complete of field painting and staining systems.
  2. Paint includes paints, enamels, stains, varnishes, lacquers, sealers, fillers and other types of coatings whether used as primers or intermediate and finish coats.
  3. Paint to completion items and surfaces left unfinished by requirements of other sections and normally requiring painting for protection, identification and decoration.
  4. Unfinished surfaces shall be painted and finished, e.g., roof top equipment, fans, duct work.
  5. Specialty items delivered with a prime coat shall be finished.
  6. Exposed uncovered pipe, exposed covered pipe, pipe hangers, connectors, grilles and other mechanical work, also exposed electric conduit, panel board, pull boxes and other electrical work requiring paint.
  7. Ferrous metal roof top mechanical units, duct work, goose necks, supports, hangers and brackets shall be included.
  8. Touch-up painting of prime coats which have become damaged or otherwise abraded or removed during construction.
  9. Items generally not to receive paint coatings, are specifically detailed below, however, may not be limited to the following:
    - a. Stainless steel, anodized aluminum, bronze and other nonferrous metals, exclusive of shop primed stainless steel.
    - b. Ceramic tile.
    - c. Resilient flooring.
    - d. Those surfaces which cannot be put into proper condition to receive paint or finish coatings.
    - e. Concealed ductwork, piping and conduit.
    - f. Shop finished items.
    - g. Acoustical materials.
    - h. Mechanical and electrical equipment, unless specifically designated.
- B. Related Sections: Sections related to this section include the following:
-

1. Shop Primed Items: Certain items are specified in other Sections to be shop primed with finish painting specified in this Section.
2. Shop Finished Items: Certain items of work are specified in other Sections to be shop finished and do not require finish painting in field.
3. Sealants: Refer to Division 7 Caulking and Sealants.

## **1.02 REFERENCES**

### **A. American National Standards Institute (ANSI):**

1. ANSI/ASTM D16: Definition of terms relating to paint, varnish, lacquer and related products.
2. ANSI/CODE Z53.1: Color and pipeline identification.
3. FEMA Technical Bulletin 2: Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas
4. FEMA Technical Bulletin 8: Corrosion Protection for Metal Connectors and Fasteners in Coastal Areas
5. ASCE 24: Flood Resistant Design and Construction

## **1.03 SUBMITTALS**

A. Manufacturer's Data: Submit copies of manufacturer's specifications and installation instructions for paint materials required, including certifications and laboratory reports to show compliance with specifications.

B. Samples: Match Architect's color chips on 5' x 7' (127 x 178 mm) primed cardboard, with color, texture and sheen duplicated to simulate actual conditions. Resubmit sample boards as necessary for selection by Architect.

### **C. Quality Assurance Submittals:**

1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
3. Manufacturer's Instructions: Manufacturer's installation instructions.
4. Manufacturer's Field Reports: Manufacturer's field reports.

D. Closeout Submittals: Warranty documents specified herein.

## **1.04 QUALITY ASSURANCE**

A. Installer Qualifications: Company specializing in commercial painting and finishing with three years experience documented and approved by product manufacturer.

B. Regulatory Requirements: Conform to applicable county, city codes for flame/fuel/smoke rating requirements for finishes.

### **1.05 DELIVERY, STORAGE & HANDLING**

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

1. Materials should be delivered to job site in original, unopened containers and packages bearing manufacturer's labels, indicating name, type and brand. Unless directed otherwise, paints are to be delivered ready mixed.
2. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
3. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, clean up, color designation and instructions for mixing and reducing.

B. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

1. Store paint materials at a minimum ambient temperature of 45°F (7°C.) and a maximum of 90°F (32°C) in a well ventilated area, unless required otherwise by manufacturer's instructions.
2. Place paint or solvent soaked rags, waste, or other materials which might constitute a fire hazard in a sealed, water filled metal container and remove from premises at close of each day's work. Take every precaution to avoid damage by fire.
3. Protect other work against damage, marking or injury by suitable covering during progress of painting and finishing work. Repair any damage done.

### **1.06 PROJECT CONDITIONS**

A. Environmental Requirements/Conditions:

1. Provide continuous ventilation and heated facilities to maintain surface and ambient temperatures above 45°F (7°C) for 24 hours before, during and 24 hours after application of finishes, unless required otherwise by manufacturer's instructions.
2. Minimum Application Temperature for Latex Paints: 50°F (10°C) for interiors; 50°F (10°C) for exterior; unless required otherwise by manufacturer's instructions.

3. Paint shall not be applied in rain, snow, fog or mist, or when relative humidity exceeds 85%. Paints, other than water-thinned coatings, shall be applied only to surfaces that are completely free of surface moisture as determined by sight, touch and moisture meter, as specified. In no case shall paint be applied to a surface upon which there is visible ice or frost.
4. Minimum Application Temperature for Varnish Finishes: For best results, apply when surface and air temperature is between 65°F and 90°F (18°C and 32°C) Do not apply below 50°F (10°C).
5. Where paint manufacturer's specifications or instructions differ from above specifications, more stringent requirements shall apply.
6. Adequate lighting must be available prior to application of any paint coating to approximate 80 foot-candles measured mid-height at substrate surface.

### **1.07 WARRANTY**

A. Manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights owner may have under the Contract Documents.

1. Warranty Period: One year commencing on Date of Substantial Completion.

### **1.08 MAINTENANCE**

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels.

1. Quantity: Provide 1 gal (3.8 L) of each color and texture to owner at completion
2. Labels: Label each container with color, texture, room locations and product description in addition to manufacturer's label.
3. Formulation: Provide owner with paint color formula and availability information on any custom product.
4. Delivery, Storage and Protection: Comply with owner's requirements for delivery, storage and protection of extra materials.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Sherwin Williams Paints, Inc.
- B. Approved substitution.

## **2.02 MATERIALS**

### **A. General:**

1. All items of painting materials shall be proprietary products of specified manufacturers. Such material shall be used without alterations and only with such thinning as called for in manufacturer's directions. Colors scheduled shall be factory mixed and exactly match approved samples.
2. Materials selected for a coating system for each type of surface shall be products of a single manufacturer, except where otherwise required by contract documents. Where shop primed materials are to be finish painted or prime coat materials are by a different manufacturer than finish coat materials, confirm compatibility of primers with manufacturer of finish coat paints.
3. Use only primers and under-coaters that are suitable for each surface to be covered and that are compatible with finish coat required.
4. Shellac and spot prime with industry accepted stain killers any marks which may bleed through surface finishes.

## **2.03 MIXES**

A. Mix proprietary materials in accordance with manufacturer's instructions, including product data and product technical bulletins.

## **2.04 SOURCE QUALITY**

A. Obtain paint and coating products from a single manufacturer.

## **2.05 GLOSS AND SHEEN LEVELS**

A. Comply with Master Painters Institute "MPI Gloss and Sheen Levels" seven level standard. The generic levels specified in the paint schedule following are based on the MPI standard levels and not to individual manufacturers' proprietary names, and shall apply the same to gloss levels for all paint types.

## **PART 3 - EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

### **3.02 EXAMINATION**

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

1. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into acceptable condition through preparatory work.
2. Beginning of application of any paint or primer coating means acceptance of existing surfaces or substrate.

B. Surface Conditions:

1. Do not proceed with surface preparation or coating application until conditions are suitable.
2. Report any conditions that can potentially affect proper application. Measure moisture content of surfaces using an electronic moisture meter.
3. Do not apply finishes unless moisture content of surface is acceptable to receive specified paint coating material.
4. Cover or otherwise protect finishes of other trades and surfaces not being painted concurrently or not to be painted.

### **3.03 PREPARATION**

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

B. Surface Preparation:

1. Remove or protect hardware, plates, trim for mechanical work, lighting fixtures and similar items placed prior to painting. Disconnect equipment adjacent to walls, where necessary and move to permit painting of wall surfaces. Following completion of painting, replace and reconnect.
2. Clean surfaces to be painted as required to remove dust, dirt or other surface contamination then properly prepare surfaces to receive paint or natural finish.
3. Before applying succeeding coats, primers and undercoats shall be completely integral and shall perform function for which they are specified. Properly prepare and touch up scratches, abrasions or other disfigurements and remove any foreign matter before proceeding with following coat. Spot priming or spot coating shall be featheredged into adjacent coatings to produce a smooth and level surface.
4. Do not apply final coats until after other work with operations that would be detrimental to finish painting have been finished in area to be painted and areas have been released for panning.

5. Shellac and spot prime with industry accepted stain killers any marks which can bleed through surface finishes. Ink markings of PVC piping can be removed with denatured alcohol.
6. Remove mildew by scrubbing surface with a solution of 4 ounces (118 mL) of pure tri-sodium phosphate, 3 quarts (2.8 L) of water and 1 quart (.95 L) of bleach. Allow this solution to remain on surface for 10 - 15 minutes, then rinse with clean water and allow surface to dry. Wear protective glasses and waterproof gloves when using this solution. Quickly wash off mixture that touches skin.
7. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish: Remove foreign particles to permit adhesion of finishing materials. Apply a latex based, compatible sealer or primer.
8. Insulated Coverings: Remove dirt, grease and oil from canvas and cotton using high pressure air and solvent cleaner as required to obtain a sealing coat.
9. Galvanized Surfaces: Remove surface contamination and then wash with clean, lint free cloths saturated with mineral spirits or lacquer thinner. Wipe dry with clean, lint free cloths. Apply coating of applicable primer.
10. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Clean surfaces with solvent. Prime bare steel surfaces. Featheredge to make touchup patches inconspicuous.
11. Interior Wood Items Scheduled to Receive Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
12. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt and rust where heavy coatings of scale are evident, and remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Spot prime weld repairs with a rust inhibitive metal primer.
13. Concrete & Concrete Masonry Units: Thoroughly clean concrete surfaces of loose particles sand, efflorescence, laitance, form oil, curing compounds or other contaminants by appropriate methods and be sure surface is dry before any paint is applied. Methods of surface preparation and cleaning shall be determined by Contractor as required in each case to ensure satisfactory paint application and performance.
14. Gypsum Drywall: Repair surface defects in gypsum drywall with drywall joint finishing compound or spackling compound filled out flush and sanded smooth. Clean surfaces and taped joints of dust, dirt and other contaminants.
15. Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit and foreign matter. Seal knots, pitch streaks and sappy sections. Fill nail holes with exterior caulking compound after prime coat has been applied. Sand any mill glaze areas to paintable wood.
16. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

### 3.04 INSTALLATION

#### A. Paint and Coatings Installation:

1. Do not apply coating until moisture content of surface is within limitations recommended by paint manufacturer. For best accuracy, test with an electronic moisture meter.
2. Apply paint, enamel, stains and varnishes with suitable brushes, rollers or spray equipment which has been kept clean, free from contamination and suitable for finish required.
3. Rate of application of coating shall not exceed that as recommended by paint manufacturer for purpose and surface involved.
4. Comply with required drying time between coats as directed by manufacturer.
5. Sand between each coat to remove defects visible from 5' (1524 mm). Finish coats shall be smooth, free from brush marks, streaks, laps, sags, skips and holidays.
6. Do not apply additional coats until completed coat has been inspected and approved by Architect. Only inspected coats of paint will be considered in determining number of coats applied.
7. Make edges of paint adjoining other material or colors clean and sharp with no overlapping.
  - a. Apply primer on Work before glazing or caulking. Paint must overlap glass 1/16" (1.6 mm) on coats.
8. Change colors at door stop corner where colors differ between adjoining spaces or rooms and where door frames match wall colors.
9. Refinish whole wall where portion of finish has been damaged or is not acceptable.
10. Back prime interior wood trim.
11. Stained and natural finishes shall be adjusted to obtain identical appearance.

#### B. Finishing Mechanical and Electrical Equipment

1. Refer to ANSI Code Z53.1 and A13.1 for color coding and identification banding of equipment, ductwork, piping and conduit
2. Access panels, electrical panels, air diffusing outlets, supply and exhaust grilles, louvers, exposed conduit, primed outlet covers, primed wall and ceiling plates and other items in painted areas shall be painted to match areas in which they occur unless specified otherwise in schedules.
  - a. Paint backsides of access panels, removable or hinged covers. Do not paint nameplates on equipment.
3. Replace identification markings on mechanical or electrical equipment when painted accidentally.
4. Paint interior surfaces of air ducts and connector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat

- black paint, to limit of sightline. Paint dampers exposed behind louvers, grilles and connector and baseboard cabinets to match face panels.
5. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
  6. Replace electrical plates, hardware, light fixture trim and fittings upon completion.

### **3.05 CLEANING**

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions, prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

1. As work proceeds, promptly remove paint where spilled, splashed or spattered.
2. During progress of work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.
3. Collect cotton waste, cloths and material which can constitute a fire hazard and place in closed water filled metal containers and remove daily from site.

### **3.06 PROTECTION**

A. Protection: Protect installed product's finish surfaces from damage during construction.

1. Protect Work of other trades against damage or injury by use of suitable covering during progress of painting and finishing work.
2. Repair damage to other surfaces caused by work of this section.
3. Remove empty paint containers from project site.
4. Post No Smoking and Wet Paint signs as required or directed.
5. Provide sand, extinguishers and other protective equipment in event of a fire created by any paint related rags or materials.

### **3.07 SCHEDULES**

A. Schedules: Refer to schedules attached herewith.

### **3.08 SCHEDULE - SHOP PRIMED ITEMS PAINT SCHEDULE**

A. Shop Primed Items for Site (Field) Finishing:

1. Metal fabrications including exposed surfaces.
2. Metal stairs and rails.
3. Air conditioning, roof structures.

### 3.09 SCHEDULE - EXTERIOR SURFACES PAINT SCHEDULE

A. Wood (Painted):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Exterior Latex Wood Primer.
  - b. Two Coats: Duration Exterior Latex Coating.

B. Concrete Masonry Units (Painted):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Loxon Acrylic Primer.
  - b. Two Coats: Sherlastic Elastomeric Coating.

C. Steel (Unprimed):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Kem Kromick Universal Metal Primer.
  - b. Two Coats: DTM Acrylic Coating.

D. Steel (Shop Primed):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. Touch up with Kem Kromick Universal Primer.
  - b. Two Coats: DTM Acrylic Coating.

E. Steel (Galvanized):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Galvite HS.
  - b. Two Coats: DTM Acrylic Coating.

F. PVC, Plastic, Fiberglass (Painted):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: PrepRite ProBlock Latex Primer
  - b. Two Coats: Solo Acrylic Semi-Gloss

G. Fiber Cement Siding (Factory Primed):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. Two Coats: Duration Exterior Acrylic Latex

H. Siding Color: Warm Pewter (SW 6572)  
See Section 07 46 00 - Foggy Day (SW 6235)

Fiber-Cement Siding

- I. Trim, Columns, Soffit, Fascia, Railings: High Reflective White (SW 7757)

**3.10 SCHEDULE - INTERIOR SURFACES PAINT SCHEDULE**

A. Wood (Stained):

1. Satin Finish (Polyurethane):
  - a. One Coat: Wood Classics Interior Stain.
  - b. Two Coats: Wood Classics Polyurethane Varnish.

B. Wood (Painted):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Prep Rite Classic Primer.
  - b. Two Coats: Classic 99 Interior Latex.

C. Steel (Unprimed):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Kem Kromick Universal Primer.
  - b. Two Coats: DTM Acrylic Coating.

D. Steel (Pre-primed):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. Two Coats: DTM Acrylic Coating.

E. Steel (Galvanized):

1. Semi-Gloss Finish (**Gloss Level 5**):
  - a. One Coat: Galvite HS.
  - b. Two Coats: DTM Acrylic Coating.

F. Gypsum Board (Painted):

1. Satin Finish (**Gloss Level 4**):
  - a. One Coat: Prep Rite 200.
  - b. Two Coats: Classic 99 Interior Latex.

G. Plywood (Painted):

- Satin Finish (**Gloss Level 4**):
  - a. One Coat: Prep Rite Classic Primer.
  - b. Two Coats: Classic 99 Interior Latex.

- H. Wall Colors (Field + Accent): See Drawings A1.9, A1.10, A5.1, A5.2,

- 1. Accent A7.1, A7.2, + A7.3
  - 2. Field Waterloo (SW9141)  
Accessible Beige (SW7036)
- I. Trim - HM Door Frames: Moth (SW9174)  
Iron Ore (SW7069) – for use with EMS interiors

**END OF SECTION**

## **DIVISION 9 - FINISHES**

### **SECTION 09 97 23**

#### **CONCRETE COATINGS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Labor, equipment and materials required for application of polyamide epoxy floor coating over concrete floors where indicated.
- B. Integral safety striping incorporated into the application of concrete coatings.
- C. Aluminum oxide non-skid aggregate.

###### **1.02 QUALITY ASSURANCE**

- A. Upon request, submit evidence of recent experience in applying coating to concrete surfaces, with recent jobs in the immediate area.
- B. Contractor shall advise those providing subsequent other items that coated areas must remain free of construction activity during curing period of surfacing.

###### **1.03 REFERENCES**

- A. SSPC-SP13 / NACE 6 Surface Preparation of Concrete: requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems.

###### **1.04 SUBMITTALS**

- A. Manufacturer's data sheets, application instructions, color charts.
- B. Submit two (2) samples (minimum 75 sq. in. each) that are representative of finished coating.
- C. Submit two (2) samples (minimum 75 sq. in. each) that one each is representative of anti-skid aggregate in base coat and anti-skid aggregate in finish coat.

###### **1.04 JOB CONDITIONS**

- A. Ensure that storage areas for coating materials are kept at temperature range recommended by manufacturer before installation is scheduled to start.
- B. If any deficiency of concrete surface to be covered is encountered or if the surface is unacceptable, notify Architect in writing prior to commencing work.
- C. Commencement of installation work implies acceptance of concrete surface as suitable to receive surfacing.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Pittsburgh Plate Glass Inc., Pittsburgh, PA 15222.
- B. Approved substitution.

### **2.02 MATERIALS**

- A. PPG Amerlock 2 High Solids Epoxy Coating @ 4.0 – 8.0 mils DFT.
  - 1. Field Color: Knight's Armor.
  - 2. Safety Striping Color: Safety Yellow.
- B. PPG 888 Anti-Skid Additive. Blend of 16 and 36 mesh aluminum oxide.
  - 1. Color: Aluminum Gray.

## **PART 3 - EXECUTION**

### **3.01 ENVIRONMENTAL REQUIREMENTS**

- A. Protect adjacent surfaces from damage resulting from work under this Section.
- B. Refer to manufacturers' container label or Material Safety Data Sheet for safety precautions.

### **3.02 INSPECTION**

- A. Examine concrete surfaces to receive coating to determine suitability. Such surfaces shall be free of membrane curing compounds, dust, paint, grease, oil, rust, moisture and other foreign substances that may affect adhesion of the coating.

- B. Surface must be dry and aged 30 days before coating.
- C. Surface shall be prepared in accordance with SSPC-SP13 guidelines and shall be rendered free of laitance, efflorescence, form release agents, and any other contamination on the surface. Providing a profile by chemical or mechanical means. Follow any additional surface preparation guidelines on technical data sheets.
- D. Vacuum to remove all loose material before painting.

### **3.03 INSTALLATION**

- A. Mix components and apply coating in accord with manufacturer's instructions. Apply by roller, brush or airless spray.
  - 1. Apply two coats to a minimum dry film thickness of 2.0 to 4.0 mils per coat.
- B. Finished Coating: Match submitted samples of coating regarding uniformity of thickness, sheen, color, pattern and texture, and free of defects detrimental to performance of the coating.
- C. Coordinate safety striping with Owner and FFE layout of rooms where safety striping is indicated. Stripes shall be 2" wide minimum.
  - 1. Lightly screen or sand the area to be striped.
  - 2. Solvent wipe the area after screen/sand is completed.
  - 3. Apply stripping coats as recommended by the manufacturer.
- D. Add anti-skid aggregate to mixed units of Amerlock 2/400GF or broadcast into the applied film in accord with manufacturer's instructions.

### **3.04 CLEAN-UP**

- A. Clean equipment immediately after use with recommended solvent.
- B. Remove left-over materials and debris and dispose of same in proper manner.

**END OF SECTION**

## **DIVISION 9 - FINISHES**

### **SECTION 09 97 26**

#### **LIQUID TYPE CONCRETE FLOOR HARDENER**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Liquid chemical-hardener to be applied over new concrete floors scheduled to receive no other finish.
- B. Not for use on floors scheduled to receive stained, polished concrete finish.

###### **1.02 SUBMITTALS**

- A. Manufacturer's data for review.

###### **1.03 JOB CONDITIONS**

- A. Allow 30 days concrete slab curing time, or as directed by manufacturer. Floor must be dry.
- B. Air and slab temperatures and relative humidity for application shall be as directed by the manufacturer.
- C. Application shall be performed by or supervised by a company representative.

###### **1.04 GUARANTEE**

- A. Provide manufacturer's guarantee that floors coated with this product will not dust as a result of abrasion and wear within 5 years from date of application.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. Kaufman Products, Inc., Baltimore, MD 21216.
- B. Approved substitution.

## **2.02 MATERIALS**

A. "SureHard" sodium silicate sealer and dust-proofer, water-based liquid application, VOC compliant, integral process coating.

## **2.03 WATER**

A. Potable.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Remove grease, oil, wax, curing compound if used and other foreign matter.
- B. Rinse thoroughly with clear water to remove residue.

### **3.02 PRECAUTIONS**

A. Keep away from heat, sparks, and flames. Provide good ventilation. Refer to manufacturer's Material Safety Data Sheet (MSDS) for information.

### **3.03 APPLICATION**

- A. Apply sealer finish to dry interior concrete floors where shown in the finish schedule.
- B. Apply all material in accord with manufacturer's instructions. Flush excess product as required to prevent residue build-up. Restrict traffic on applied surfaces in accord with manufacturer's recommendations.
- C. Spreading Rate: Comply with manufacturer's recommendations.

**END OF SECTION**

## **DIVISION 10 - SPECIALTIES**

### **SECTION 10 14 19**

#### **DIMENSIONAL LETTER + SEAL SIGNAGE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Cast aluminum building letters for exterior application.
- B. Cut acrylic building letters for interior application.

###### **1.02 SUBMITTALS**

- A. Material Samples: Submit available aluminum finishes (satin with topcoat, clear anodized or bronze anodized), acrylic color selection, and matched PVC plastic for selection, plus one full size sample of a letter of the size and font detailed for interior and exterior use.
- B. Product Data.
- C. Shop Drawings: Illustrate the layout, spacing, font, size and mounting method of installing building letters.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. The Southwell Company, San Antonio, TX 78291.
- B. Alphabet Signs, Inc., Gap, PA 17527.
- C. Approved substitution.

###### **2.02 ITEMS**

- A. Aluminum letters cast from 319 aluminum alloy with satin polished faces and matte sides. As manufactured by the Southwell Company.
    - 1. Size: 8" high x 1/4" thick.
      - a. Allow for six (6) letters: "TOWN OF".
      - b. Allow for fifteen (15) letters: "TOWN, POLICE, EMS".
-

2. Size: 16" high x ¼" thick.
  - a. Allow for ten (10) letters: "DEWEY BEACH".
3. Font: as selected by Architect, basis of design in Century Gothic.
4. Finish: as selected by Architect.
5. Mounting Method: E-6 Projected Mounting Method.

B. Aluminum letters cast from 319 aluminum alloy with satin polished faces and matte sides. As manufactured by the Southwell Company.

1. Size: 36" diam x ¼" thick (Town of Dewey Beach Seal)
2. Allow for twenty-two (22) letters and two bullet points ("Dewey Beach Delaware • 1981 •").
3. Font: to match existing logo.
4. Colors: to match existing logo
5. Mounting Method: A mounting template designating stud locations shall be provided. Stud size and type shall be as required by manufacturer for application and design intent.

C. Multipurpose Room Wall: Flat Cut Acrylic Letters. Vicat Softening Temperature of 227 degrees F. Resistant to chemicals and corrosion and incorporates UV inhibitors to reduce fading of colors. As manufactured by Alphabet Signs.

6. Size: 36" diam x ¼" thick (Town of Dewey Beach Seal)
7. Allow for twenty-two (22) letters and two bullet points ("Dewey Beach Delaware • 1981 •").
8. Font: to match existing logo.
9. Colors: to match existing logo
10. Mounting Method: A mounting template designating stud locations shall be provided. Stud size and type shall be as required by manufacturer for application and design intent.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. Per manufacturer's details and instructions.

**END OF SECTION**

## **DIVISION 10- SPECIALTIES**

### **SECTION 10 21 13**

#### **TOILET COMPARTMENTS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Overhead braced high density polyethylene (HDPE) toilet partitions and urinal screens.

###### **1.02 SUBMITTALS**

A. Shop drawings and catalog cuts for review.

B. Manufacturer's color chart for color selections.

C. Sample of selected partition material, color and finish, min. 3" x 3" sample.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

A. Scranton Products Inc., Scranton, PA 18505.

B. Approved substitution.

###### **2.02 UNITS**

A. Compartments: Hiny Hiders partitions. High density polyethylene, waterproof and nonabsorbent, overhead braced, aluminum anti-grip head rail, floor supported, with stainless steel pilaster shoe.

1. Doors and Panels: 1" thick single component construction with 1/4 inch radius edges. Stainless steel head strips shall be applied to bottom edges of panels and doors.
  2. Pilasters: 1" thick single component construction, fitted with 11-gauge stainless steel foot for attachment to min. 3/8" floor studs and expansion shields.
-

3. Color: Black.
4. Finish: Orange Peel.

B. Hardware: Stainless steel. Theft proof bolts. Combination coat hook and bumper, chrome plated. Gravity hinges, latch, keeper with emergency access. Brackets full height aluminum with mill finish.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION**

A. Set partitions rigid, straight, plumb and level per manufacturer's latest printed instructions.

B. Perform adjustments to leveling devices, door hardware, and other operating parts.

#### **3.02 CLEANING**

A. Clean exposed surfaces and touch up minor finish imperfections.

**END OF SECTION**

## **DIVISION 10- SPECIALTIES**

### **SECTION 10260**

#### **CORNER GUARDS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Surface mounted vinyl/acrylic extrusions formed into corner guards to be used on all exposed gypsum wallboard corners except in locations where wainscot is applied.
- B. Surface mounted vinyl acrylic crash rails to be used in all public/patient corridors and waiting areas except in locations where wainscot is applied.

###### **1.02 SUBMITTALS**

- A. Full size sample of selected model and color, including end caps where applicable, mounting hardware.
- B. Details, location schedules and installation instructions.

###### **1.03 QUALITY ASSURANCE**

- A. Vinyl/acrylic extrusions shall be UL Classified, identified with appropriate marking.

###### **1.04 PROJECT CONDITIONS**

- A. Minimum temperature for protective wall covering must be +70F with relative humidity not over 80%.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. InPro Corporation, Muskego, WI 53150.
- B. Approved substitutions.

###### **2.02 MATERIALS**

A. Extrusions: High impact vinyl/acrylic with a matte finish pebblette grain surface in color. Furnish end caps in coordinating color, designed for direct mechanical attachment to the retainer.

B Retainers: Aluminum extrusion of .070" thickness. Include non-corrosive attachment hardware.

### **2.03 MANUFACTURED UNITS**

A. Corner Guard: Model 130 surface mounted corner guard with rigid vinyl wall covering insert where required due to varying wall thicknesses and/or end wall applications with double corner guards. Top of corner guard shall be 40" A.F.F.

1. Allow for one (1) main color.
  - a. Main color: 0104 Antique White.
2. Corner guards abutting accent colors shall match accent colors.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. Conform to manufacturer's recommendations and approved details.

B. Corner Guards: Securely fasten retainers to wall on both sides of corner. Hand pressure lock guards over retainers.

C. Install straight and true over entire length

### **3.02 CLEANING**

A. Remove grime and common stains using ordinary commercial cleaning solutions.

**END OF SECTION**

## **DIVISION 10- SPECIALTIES**

### **SECTION 10 26 10**

#### **VINYL WALL PROTECTION**

##### **PART 1 – GENERAL**

###### **1.01 SUMMARY**

A. Rigid vinyl wall system for protection and decoration.

###### **1.02 SECTION INCLUDES**

A. Partial height wall protection for use in lobbies, restrooms, courtroom, and multipurpose room. Full height wall protection in multipurpose room.

###### **1.03 SYSTEM DESCRIPTION**

A. Provide wall protection that conforms to the following requirements of regulatory agencies.

1. 1. Fire Performance Characteristics: Provide UL Classified Rigid Vinyl Sheet conforming with the NFPA Class A fire rating. Surface burning characteristics as determined by UL-723 (ASTM E-84) shall be a maximum flame spread of 20 and a maximum smoke developed of 350 for .060" (1.5mm) thick material.
2. Fire Performance Characteristics: Provide UL Classified with NFPA Class A fire rating. Surface burning characteristics as determined by ASTM E-84 shall be flame spread of 25 and smoke developed of 400.
3. Self-Extinguishing: Provide rigid vinyl sheet with a CC1 classification, as tested in accordance with the procedures specified in ASTM D-635-74, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position, as referenced in UBC 52-4- 1988.
4. Impact Strength: 30.4 ft-lbs/ inch of thickness as tested in accordance with the procedures specified in ASTM D-256-90b, Impact Resistance of Plastics.
5. Chemical and Stain Resistance: Provide rigid vinyl sheet that shows resistance to stain when tested in accordance with applicable provisions of ASTM D-543.
6. Fungal and Bacterial Resistance: Provide rigid vinyl that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.

7. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.

#### **1.04 SUBMITTALS**

- A. Product Data: Manufacturer's printed product data for each type of Rigid Vinyl Sheet specified.
- B. Detail Drawings: Mounting details with the appropriate adhesives for specific project substrates.
- C. Samples: 8" (203mm) square, of each type and color indicated.
- D. Manufacturer's installation instructions.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in unopened factory packaging to the jobsite
- B. Inspect materials at delivery to assure that specified products have been received.
- C. Store in original packaging in a climate controlled location away from direct sunlight.

#### **1.06 PROJECT CONDITIONS**

- A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

#### **1.07 WARRANTY**

- A. Standard Limited Lifetime Warranty against material and manufacturing defects.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURER**

- A. InPro Corporation, Muskego, WI 53150.
- B. Approved substitutions.
- C. Provide all IPC Rigid Vinyl Sheet and wall protection from a single source.

## **2.02 MANUFACTURED UNITS**

### **A. Rigid Vinyl Sheet:**

1. IPC Palladium® Rigid Vinyl Sheet #305. Thickness: .040".
2. Color of IPC Sheet to be selected by the architect from the IPC Sheet finish selection. Surface shall have a velvet texture.
3. Allow for one (1) main color.
  - a. Main color: 0104 Antique White.
4. Allow for two (2) accent colors. Refer to A7.2 + A7.3.
  - a. Accent Color #1: 0545 Crown Cherry.
  - b. Accent Color #2: 0532 Santa Rosa Oak.

### **B. Moldings**

1. Palladium 3D Boards: Horizontal Board, Horizontal Top Cap Board, Vertical Board, Inside Corners Partial Height, Inside Corners Full Height, Outside Corners, Outside Corners Full Height, Top/Base Shoe.

C. Caulk: color matched vinyl seal shall be used in place of top caps, divider bars and inside corners. Provide tight, hairline seams of sheets and moldings to minimize caulk.

## **2.03 MATERIALS**

A. Vinyl: IPC Rigid Sheet shall be manufactured from chemical and stain resistant polyvinyl chloride with the addition of impact modifiers. No plasticizers shall be added.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and conditions in which the sheet will be installed.
1. Complete all finishing operations, including painting, before beginning installation of non-PVC sheet materials.
- B. Wall surface shall be dry and free from dirt, grease and loose paint.

### **3.02 PREPARATION**

A. Prior to installation, clean substrate to remove dust, debris and loose particles.

### **3.03 INSTALLATION**

A. General: Locate the Wall Protection as indicated on the approved detail drawing for the appropriate substrate and in compliance with the IPC installation instructions. Install level and plumb at the height indicated on the drawings. Field trimming is not recommended or supported.

B. Installation of Palladium® Rigid Vinyl Sheet

1. Adhere to substrate with InPro Bond, a freeze-thaw stable, nonflammable, high strength, water based adhesive that trowels on and allows approximately 20 minutes working time before firming.
2. Adhere to substrate with XT-2000+, a freeze-thaw stable, nonflammable, high strength, water based adhesive that trowels on and allows approximately 20 minutes working time before firming.
3. Adhere to substrate with Fastbond 30, a nonflammable, high strength, water-dispersed contact adhesive, with very little odor. Smooth roll surface.

### **3.04 CLEANING**

A. At completion of the installation, clean surfaces in accordance the InPro cleanup and maintenance instructions.

**END OF SECTION**

## **DIVISION 10- SPECIALTIES**

### **SECTION 10 26 41**

#### **BULLET RESISTANT PANELS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Bullet resistant fiberglass panels.

###### **1.02 REFERENCES**

- A. American Society for Testing and Materials:
  - 1. ASTM E119-98 Standard Test for One-Hour Fire-Rating of Building Construction and Materials
  - 2. ASTM F1233-98 Standard Test Method for Forced Entry Testing of Materials/Assemblies, body passage requirement, Class IV
  - 3. ASTM E 90-97 Standard Method for Laboratory Measurement of Airborne Sound
- B. National Institute of Justice Ballistic Standards: NIJ Standard 0108.01 – Type III
- C. Underwriters Laboratories: UL 752 Specifications and Ammunition, 11th Edition, Standard for Bullet Resisting Equipment published September 9, 2005, revised December 21, 2006, Level 8
- D. The United States Department of State: The International Traffic in Arms Regulations (ITAR)

###### **1.03 SUBMITTALS**

- A. Product data including specifications and brochures.
- B. Sample, min. 6" x 6" square piece of material to be installed.

###### **1.04 WARRANTY**

- A. Warrant all materials and workmanship against defects for a period of ten (10) years from the date of Substantial Completion.

##### **PART 2 - PRODUCTS**

## **2.01 MANUFACTURER**

- A. ArmorCore by Waco Composites, Waco, TX 76710.
- B. Approved substitution.

## **2.02 MATERIALS**

A. Bullet Resistant Fiberglass Panels: fabricated of multiple layers of woven roving ballistic grade fiberglass cloth impregnated with a thermoset polyester resin and compressed into flat rigid sheets. "Non ricochet type" to capture and retain attacking projectile, lessening the potential of a random injury or lateral penetration.

- 1. Thickness: 1 7/16" nominal thickness
- 2. Nominal Weight: 15.2 lbs. per sq. ft.
- 3. Panel Rating: UL752 Level 8.
- 4. Bullet resistance of joints: equal to that of the panel.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

A. Prior to starting installation, verify work of related trades required in contract documents and architectural drawings is complete to the point where work of this Section may properly commence. Notify Architect in writing of any discrepancies.

### **3.02 INSTALLATION**

- A. Install armor in accordance with manufacturer's printed recommendations.
- B. Secure armor panels using screws, bolts, or an industrial adhesive.
- C. Method of application shall install panels minimizing vulnerabilities by fitting tightly to adjacent surfaces including concrete floor slab, concrete roof slab, bullet resistive door frames, bullet resistive window frames, and the like.

### **3.03 JOINTS**

A. Reinforce joints with a back-up layer of bullet resistive material. Minimum width of reinforcing layer at joint shall be 4-inches, centered on panel joints.

**END OF SECTION**

## **DIVISION 10 - SPECIALTIES**

### **SECTION 10 43 13**

#### **EMERGENCY SPECIALTIES CABINETS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Furnishing and installing defibrillators and cabinets.
- B. Furnishing and installing bleed control kits and cabinets.

###### **1.02 REFERENCES**

- A. American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care - current Edition.

###### **1.03 SUBMITTALS**

- A. Catalog data for review.
- B. Materials by a single company throughout project.

###### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Package, handle, deliver and store at job site in a manner to avoid damage. Damaged equipment will be rejected.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. AED Superstore by Allied 100, LLC, Woodruff, WI, 54568.
- B. Rescue Essentials, Leland, NC 28451.
- C. Approved substitution.

###### **2.02 AED CABINET**

- A. AED Superstore: Physio-control standard cabinet, recessed mounted.

Coordinate power requirements with owner supplied AED.

1. Cabinet inside dimensions: 14" H x 14" H x 6-1/8" deep.
2. Weight: 14 lbs.
3. Finish: factory-coated steel.
4. Strobe: satellite, wiring provided by manufacturer.
5. Power: factory-installed 9V battery for audible alarm and strobe. No A/C power connection required.

### **2.03 BLEED CONTROL CABINET**

A. Rescue Essentials #50-0989. Semi-recessed cabinet to house owner supplied medical kit. Cabinet to be made of 20-gauge steel with continuous hinge, roller catch and chrome handle.

1. Cabinet inside dimensions: 14" H x 14" W x 7" D
2. Weight: 16.5 lbs
3. Finish: factory-coated steel.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. In accord with manufacturer's instructions for type of mounting required. Maximum height to top of cabinet above floor shall be 4'-8". Meet ADA criteria for projection from wall (4" maximum) including handle.

B. Fasten securely to structure using type of fastener or anchor as required by wall construction.

**END OF SECTION**

## **DIVISION 10 - SPECIALTIES**

### **SECTION 10 44 20**

#### **INTERIOR SIGNS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Wall signs consisting of a room number and room function to meet the requirements of the Americans with Disabilities Act (ADA) and CABO/ANSI A117.1.

###### **1.02 REFERENCES**

A. Signs must comply with applicable provisions of ICC/ANSI A117.1 and ADAAG.

###### **1.03 SUBMITTALS**

A. One full size sign sample illustrating the design, construction, colors, typestyles, mounting method and other details as specified. Provide sample in small size sign. Samples will be returned for use in Project.

B. Color charts for laminate selection.

C. Signage Schedule complete with location of each sign and the required copy/text.

C. Shop drawings of each sign type shown herein.

1. Indicate materials, sizes, configurations, and applicable mountings.
2. Typography sample for typical inserts.
3. Artwork for special graphics.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

A. Inpro Corp., Muskego, WI 53150.

B. Approved substitution.

## **2.02 INTERIOR WALL SIGNS**

- A. Interior Signage, Aspen II. Molded frames shall be manufactured of injection molded thermoplastic, with radius edges. Finish color to be selected by manufacturer's standard range of colors: Antique White 0104 border and text; Cadet Blue 0134 field.
- B. Tactile – Raised Characters
1. Grade 2 Braille: Provide Grade 2 Braille produced with the Raster™ Method, patented process for placing Braille on signage. Raster™ Braille is computer engineered using a carbide-engraving bit, press-fit tool with vacuum pump and UV stable acrylic rasters.
  2. Solid Colors: Provide sign panel consisting of .060" (2mm) sheet bonded with .040" (1mm) sheet that is cut and assembled to create signage.
- B. Size of letters shall be as follows:
1. Room numbers shall be 1".
  2. Lettering for room ID signs shall be ¾".
  3. Symbol size shall be 4".
  4. Standard Grade 2 Braille shall be ½" below copy.
- C. Sign Sizes shall be as follows:
1. Room Function signs, 3" x length required.  
Quantity: 36
  2. Office signs shall be design M-310-A (two windows). Window inserts by sign fabricator based on copy furnished by Owner. Sign Size 7" x 8".  
Quantity: 17
  3. Restroom signs shall be design ADA-4 size 8" x 8" with a 4" accessibility symbol, gender symbols and the verbal description placed directly below followed by Grade 2 Braille.  
Quantity: 9
  4. Exit signs, 3" x length required. Verbal description with Grade 2 Braille directly below.  
Quantity: 9
- D. Screw Mount: Provide screw mount unframed signage with exposed mounting fasteners. Fasteners to be located at each corner, 3/16" (5mm) Diameter.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions, in locations and
-

with mounting methods as specified in sign and location drawings.

B. Square, plumb and level all installed products.

C. Install all signage in accordance with the 2010 Standard for Accessible Design (SAD) effective in March 2011, and any applicable local regulations and/or codes. Signs must be set at a uniform height of 60" from the floor to the centerline of the sign and 8" - 12" from the latch side of door throughout the buildings unless directed otherwise.

D. Fasten laminated signs to wall using theft proof stainless steel screws in plastic expansion shields screws 3/4" long. Signs must be set at a uniform height of 60" from the floor to the centerline of the sign and 8" - 12" from the latch side of door throughout the buildings unless directed otherwise.

E. Install signs in strict accordance with manufacturer's printed instructions.

**END OF SECTION**

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## **DIVISION 10 - SPECIALTIES**

### **SECTION 10511**

#### **METAL LOCKERS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Metal lockers and accessories where shown.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. Spacesaver, LLC, Fort Atkinson, WI 53538.
- B. Approved substitution.

###### **2.02 MANUFACTURED UNITS**

- A. Multi Tiered Gear Lockers: Standard powder coated steel metal lockers, 18" wide by 18" deep by 36"h, double tier, complete with coat rod + hook, 20" legs with zee base closure trim, sloped tops, number plate and padlock attachment.

1. Construction:
  - a. Fabricate from cold rolled sheet steel. Minimum gauges shown. Welded construction.
  - b. Body of Locker: 16 gauge steel sides with 18 gauge solid back. Tops, bottoms of 16 gauge steel.
  - c. Doors: 16 gauge steel with louvered shaped perforations at top and bottom.
  - d. Door Frames: 16 gauge steel.
2. Provide lock bar, handle, integral padlock eye and spring latch for each locker.
3. Hinges: Two inches high, full loop tight pin type, 2 per door.
4. Finish:
  - a. Thoroughly clean, give a rust inhibitive phosphate treatment, then heavy coat of baked on enamel.
  - b. Color as selected from manufacturer's standard colors.
5. Number Plates: Polished aluminum, with black numerals attached with split rivets.

B. Locker Room Benches: min. 20" w. x min. 42" h. – min. 24" d. laminated finish wood locker room bench top 10 gauge steel bench pedestals.

1. Basis of Design: ASI bench with trapezoidal pedestals, 16 gauge stainless steel.
2. For locker rooms.

C. Universal Weapons Rack: Standard powder coated steel metal lockers, with perforated metal doors and sides, adjustable brackets, barrel supports, support rails, universal base + stock cups, bins, and dividers. Complies with OPNAVINST 5530.13C and AR 190-11, MARCORSSCOM, and TACOM standards. Widths of 42" or 22", depths of 24", and heights up to 84"

1. Construction:
  - a. Fabricate from cold rolled sheet steel. Minimum gauges shown. Welded construction.
  - b. Body of Locker: 16 gauge steel sides with 18 gauge solid back. Tops, bottoms of 16 gauge steel.
  - c. Doors: 16 gauge steel with louvered shaped perforations at top and bottom.
  - d. Door Frames: 16 gauge steel.
2. Provide lock bar, handle, integral padlock eye and spring latch for each locker.
3. Hinges: Two inches high, full loop tight pin type, 2 per door.
4. Finish:
  - a. Thoroughly clean, give a rust inhibitive phosphate treatment, then heavy coat of baked on enamel.
  - b. Color as selected from manufacturer's standard colors.
5. Number Plates: Polished aluminum, with black numerals attached with split rivets.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Set lockers in place and secure as required.
- B. Follow installation instructions to achieve a plumb, level, rigid installation.

### **3.02 ADJUSTING**

- A. Adjust latches to insure door is engaging latch hook properly.

**END OF SECTION**

## **DIVISION 10 - SPECIALTIES**

### **SECTION 10 52 20**

#### **FIRE EXTINGUISHERS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Furnishing and installing fire extinguishers and cabinets where indicated.

###### **1.02 REFERENCES**

- A. ANSI/UL Standard 299.
- B. NFPA 10: Portable Fire Extinguisher.

###### **1.03 SUBMITTALS**

- A. Catalog data for review.
- B. Materials by a single company throughout project.

###### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Package, handle, deliver and store at job site in a manner to avoid damage. Damaged equipment will be rejected.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. J.L. Industries, Bloomington, Minnesota, 55435.
- B. Approved substitution.

###### **2.02 MATERIALS**

- A. Fire Extinguisher: UL rating 4A-80BC, 10 lb. capacity, for Class ABC fires, with steel cylinder. Cosmic 10E, Multi-Purpose Dry Chemical.

B. Fire Extinguisher Cabinet: Semi-recessed rolled edge satin finish stainless steel frame and door, with 1/4" clear acrylic plastic panel insert in door. Cosmopolitan Series, full glass F10 door, series 1037.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. In accord with manufacturer's instructions for type of mounting required. Maximum height to top of cabinet above floor shall be 4'-8". Meet ADA criteria for projection from wall (4" maximum) including handle.

B. Fasten securely to structure using type of fastener or anchor as required by wall construction.

C. Check extinguisher for proper charge.

D. Remove and replace damaged, defective or under charged units.

**END OF SECTION**

## **DIVISION 10 - SPECIALTIES**

### **SECTION 10 75 16**

#### **GROUND SET FLAGPOLE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Cone tapered, ground set aluminum flagpoles, internal halyard with ground sleeve.
- B. Maximum recommended flag size: 5 X 8 feet. Flags furnished by owner.

###### **1.02 SUBMITTALS**

- A. Shop drawings and catalog data for review.

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

- A. Wrap and package to assure protection during transit.
- B. If stored on site for an extended period, remove wrapping material and store bare in a protected, dry place off the ground.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. American Flagpole, Abingdon, VA 24210.
- B. Approved substitution.

###### **2.02 DESIGN CRITERIA**

- A. Wind loading: Design flagpoles, bases and anchorage devices to withstand 90 mph wind, un-flagged.

###### **2.03 MATERIALS**

- A. Flagpole: Aluminum: 6063T6 alloy, seamless.

B. Other items: Materials standard with flagpole manufacturer and compatible with aluminum.

## **2.04 FLAGPOLE**

A. Sentry Series: 30 feet exposed height, 6 inch butt, 3-1/2 inch top, 0.156 inch wall thickness. At manufacturer's option, may be shipped in two sections for field assembly with internal splicing sleeve. Field verify, installation to avoid existing power lines and any other misc utilities.

B. Internal halyard with ground sleeve.

C. Finish: Directional satin ground.

## **2.05 ORNAMENTS**

A. Ball top, aluminum with gold anodized finish.

B. Lights with mounting ring: Refer to electrical drawings.

## **2.06 FITTINGS:**

A. Truck: Double revolving, 2-3/8 inch diameter sheaves, non-fouling type; aluminum. Finish exposed metal to match flagpole.

B. Halyards and snap hooks: Stainless steel aircraft cable with two sets of bronze chrome plated snap hooks.

C. Winch: Provided inside pole to raise and lower the flag by use of a removable hand crank. Automatic brake system.

D. Collar: Spun aluminum finished to match poles.

E. Foundation sleeve 16 gauge corrugated galvanized steel, set on steel base plate with welded steel centering wedges and support plate welded to 3/4" diameter ground spike 18" long.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. Construct concrete foundation and set flagpole in place in accord with the manufacturer's details and instructions.

**END OF SECTION**

## **DIVISION 10 – SPECIALTIES**

### **SECTION 10 80 00**

#### **TOILET AND BATH ACCESSORIES**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. This section specifies manufactured items usually used in toilets and related spaces.

B. Items Specified:

1. Paper towel dispenser.
2. Sensor activated hand dryer.
3. Grab bars.
4. Toilet tissue dispenser.
5. Soap dispensers (wall mounted).
6. Mirrors.
7. Utility shelf with mop/broom holder.
8. Sanitary napkin disposal.
9. Hat and coat hook.
10. Shower curtain and rod.
11. Baby changing station.
12. Lavatory ADA shield.

##### **1.02 SUBMITTALS**

A. Submit in accordance with Section 01 33 00, SUBMITTALS.

B. Manufacturer's Literature and Data:

1. All accessories specified.
2. Show type of material, gages or metal thickness in inches, finishes, and when required, capacity of accessories.

##### **1.03 QUALITY ASSURANCE**

A. Each product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.

- B. Each accessory type shall be the same and be made by the same manufacturer.
- C. Each accessory shall be assembled to the greatest extent possible before delivery to the site.
- D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

#### **1.04 PACKAGING AND DELIVERY**

- A. Pack accessories individually to protect finish.
- B. Deliver accessories to the project only when installation work in rooms is ready to receive them.
- C. Deliver inserts and rough-in frames to site at appropriate time for building-in.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Bobrick Washroom Equipment, Inc.
- B. Air Delights, Inc.
- C. Truebro IPS Corporation.
- D. Approved substitution.

#### **2.02 MATERIALS**

- A. Aluminum: ASTM B221, alloy 6063-T5 and alloy 6463-T5.
- B. Stainless Steel: ASTM A167, Type 302, 304, or 304L, except ASTM A176 where Type 430 is specified, 0.0299-inch thick unless otherwise specified.
- C. Stainless Steel Tubing: ASTM A269, Grade 304 or 304L, seamless or welded.
- D. Stainless Steel Pipe: ASTM A312; Grade TP 304 or TP 304L.
- E. Steel Sheet: ASTM A526, zinc-coated (galvanized) coating designation G90.
- F. Glass.

1. ASTM C1036, Type 1, Class 1, Quality q1, for mirrors.

## **2.02 FASTENERS**

- A. Exposed Fasteners: Stainless steel or chromium plated brass, finish to match adjacent surface.
- B. Concealed Fasteners: Steel, hot-dip galvanized (except in high moisture areas such as showers or bath tubs use stainless steel).
- C. Toggle Bolts: For use in hollow masonry or frame construction.
- D. Sex bolts: For through bolting on thin panels.
- E. Expansion Shields: Lead or plastic as recommended by accessory manufacturer for component and substrate for use in solid masonry or concrete.

## **2.03 TOILET ACCESSORIES SCHEDULE**

- A. Paper Towel Dispensers: Surface mounted Type-304 22 gauge stainless steel. Unit dispenses C-fold and multi-fold paper towels. Mount with concealed fasteners.
  1. Basis of design: Bobrick B-2621.
    - a. For kitchenettes.
  2. Basis of design: Bobrick B-3944
    - a. For all restrooms.
- B. Sensor Activated Hand Dryer: Series commutated, through-flow discharge, vacuum type motor/blower combination, surface mounted, 208 VAC, 7 amp, 60 Hz, 1456 watts, stainless steel housing.
  1. Basis of Design: Air Delights Xlerator XL-SB.
  2. For all restrooms.
- C. Grab Bars: 18 gauge stainless steel with outside diameter of 1-1/2". Concealed mounting.
  1. Basis of design: Bobrick B-6806 series.
  2. Length 42" at sides of water closet, 36" behind water closet.
- D. Toilet Tissue Dispensers: Double roll dispenser sized to accommodate a 6" diameter roll. Heavy duty cast aluminum with high impact plastic spindle.
  1. Basis of design: Bobrick B-274.
  2. For all toilets.

E. Soap Dispensers (Wall Mounted): Surface mounted soap cartridge dispenser 500ML.

1. Basis of design: Bobrick B-26607
2. For all restroom lavatories and vanities.

F. Metal Framed Mirrors: Stainless steel framed mirror units angle frames of not less than 18 gauge (0.50 inch) with square corners mitered, welded and ground smooth. Provide in No. 4 satin polished brass.

1. Basis of design: Bobrick B-290 Series.
2. For all single-user toilet rooms and compartments.

H. Utility Shelf with Mop/Broom Holders: Stainless steel utility shelf with mop/broom holders and rag hooks. Shelf 18 gauge 8" deep. Unit 34" long with 2 shelf brackets, 4 hooks and 3 mop holders.

1. Basis of design: Bobrick B-239 x 34.
2. For Janitor's Closet.

I. Sanitary Napkin Disposal: Type 304 stainless steel unit, toilet partition mounted back-to-back.

1. Basis of design: Bobrick B-4354 Contura Series.
2. For all Women's toilet compartments.

J. Hat and Coat Hook: Type 304 stainless steel with satin finish.

1. Basis of design: Bobrick B-6827.
2. For all toilet compartment doors, shower compartment walls, private office doors, and Locker Room walls.

K. Shower Curtain with Rod: Opaque white vinyl shower curtain with antibacterial and flame retardant agents, nickel plated brass grommets, 1-inch diameter 20 gauge stainless steel curtain rod with concealed mounting.

1. Basis of design: Bobrick B-204 curtain with B-207 curtain rod.

L. Frameless Mirrors: 1/4" Glass Mirror with safety backing. Mirror mastic to be an adhesive setting compound, asbestos-free, produced specifically for setting Mirrors and approved by mirror manufacturer and substrate manufacturer. Mirror hardware: top and bottom aluminum J-Channels, clear anodized finish, with a return deep enough to produce a glazing channel to accommodate 1/4" thickness and in lengths required to cover edges in a single piece. Mirror top and bottom clips: Provide wall mounting

bracket and self-tapping screws as provided in manufacturers installation details.

1. For all restroom double vanities.

M. Baby Changing Station: Koala Kare Products a Division of Bobrick, KB310-SSRE Horizontal Stainless Steel and KB311-SSRE Vertical Stainless Steel. Recessed mounted baby changing station. Made of FDA approved blow-molded high-density polyethylene (HDPE) with 18-Gauge Type 304 stainless steel, brushed finish flange and cover. Where infeasible, provide surface mounted changing stations.

1. For Restroom 107, Restroom 108, Men's Restroom 208, and Women's Restroom 210.

N. Lavatory shield: LAVSHIELD by Truebro, a Division of IPS Corporation, dimensionally engineered to fit electronic faucet components, mixing valves, trap primers, water heaters, sanitary drains, shut off valves and other under-sink assemblies.

1. For all wall-mounted lavatory sink basins.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

A. Install accessories in accordance with the manufacturer's printed instructions and ASTM F446.

B. Install accessories plumb and level and securely anchor to substrate.

C. Install accessories in a manner that will permit the accessory to function as designed and allow for servicing as required without hampering or hindering the performance of other devices.

D. Position and install dispensers, and other devices in countertops, clear of drawers, permitting ample clearance below countertop between devices, and ready access for maintenance as needed.

E. Align mirrors, dispensers and other accessories even and level, when installed in battery.

F. Install accessories to prevent striking by other moving, items or interference with accessibility.

**END OF SECTION**

## DIVISION 11 - SPECIALTIES

### SECTION 11 91 10

#### DETENTION FURNISHING & ACCESSORIES

##### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

###### A. Materials

Furniture products shall be constructed from materials that meet or exceed ASTM specifications for Hot Rolled, Galvanized and Stainless steels. All materials shall be free from corrosion, scale or other imperfections that may impair appearance and/or durability of function.

###### B. Welding

All components are welded utilizing inert-gas-shielded fusion or resistance processes. Welding shall be performed by experienced welders certified to AWS D1.3. Exposed welds, as viewed from the exterior of the item, shall extend the full length of the joining edge and shall line up smooth and flush with the adjacent surfaces. Unexposed welds do not require finish grinding but shall have a good uniform appearance

###### C. Finishing

Prior to application of top coat finishes, tool marks and surface imperfections on exposed surfaces shall be dressed smooth by grinding, filling and sanding. All surfaces shall then be cleaned of rust, oil, or other impurities by receiving a multi-stage pre-treatment consisting of degrease and phosphate coating, clear water rinse and non-chromate sealer and RO water rinse, to condition the surface of the metal to inhibit corrosion and promote paint adhesion. Items shall then be prime coated as a standard with a 2 part urethane primer to a dry film thickness of 1 – 1.5 mils. (Prime coating is standard on all Trussbilt furniture.) Powder coating and other top coats are optional.

##### 1.03 RELATED SECTIONS

- A. Section 03 30 00 - Cast in Place Concrete
- B. Section 03 35 00 - Polished Concrete System
- C. Section 09 91 00 - Paints

##### 1.04 REFERENCES

- A. ASTM A 1008 / A 1008M-03, Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
- B. ASTM A 1011 / A 1011M-03, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
- C. ASTM A 653/A 653M-02, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dipped Process, (Commercial Steel)
- D. ASTM A 666-00, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
- E. NAAMM HMMA 803-98, Steel Tables

ANSI                      American National Standards Institute, Inc.

ASTM                     American Society for Testing and Materials

NAAMM                 National Association of Architectural Metal Manufacturers

## **1.05 TESTING AND PERFORMANCE**

- A. Furniture Static Load Test: products shall be designed to withstand 1500 pound static loads.
- B. Test Reports: the manufacturer shall provide test reports and documentation by an independent testing laboratory.

## **1.06 QUALITY ASSURANCE**

### **A. Manufacturer's Qualifications**

1. Manufacturer shall provide evidence of having personnel and plant equipment capable of fabricating furniture assemblies of the type specified herein.
2. Manufacturers shall be ISO 9001:2000 certified and shall be required to present its Certificate of Registration upon request.
3. Manufacturer's production welders shall be qualified under AWS D1.3, and upon request manufacturer shall provide copies of Welders Certifications in accordance with AWS D1.3.

4. Manufacturers shall have a minimum of ten (10) years experience successfully producing detention furnishings of the types and sizes required in the contract documents.
5. Manufacturers shall have written reports of having passed the testing requirements of section 1.05 using its current materials and production processes.

## **1.07 SUBMITTALS**

### **A. Submittal Drawings**

1. Drawings shall show furnishings elevations and sections.
2. Drawings shall list item descriptions including locations, material thicknesses, and anchor means.

## **1.08 WARRANTY**

All furniture items shall be warranted from defects in workmanship and quality for a period of one (1) year from shipment.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

- A. Trussbilt, LLC; 555 Lincoln Avenue NW; Huron, South Dakota
- B. Approved substitution.

### **2.02 DETENTION SECURITY FURNISHINGS**

#### **A. Key Cabinet**

1. Trussbilt Model No.
  - a. KC-60 (60 keys)
2. Materials
  - a. Cabinet body and door shall be constructed from 10 gauge mild steel.
  - b. Interior key panels shall be constructed from 12 gauge mild steel.

c. Key mount brackets shall be constructed from 14 gauge mild steel.

3. Construction

a. Heavy duty key cabinet shall be constructed from 10 ga. steel. Size 24" tall x 16-5/8" wide x 7" deep.

b. 14 ga. key hook strips on interior of cabinet shall accommodate paracentric and mogul keys.

c. 12 ga. hinged interior panels with key hook strips (models KC-180 and KC-300) shall be added for increased key capacity.

d. Cabinet door shall be supplied with heavy duty continuous hinge and provision for 10 series lock (lock by others).

e. All components shall be welded utilizing inert-gas-shielded fusion or resistance processes. Welding shall be performed by experienced welders certified to AWS D1.3. Exposed welds, as viewed from the exterior of the item, shall extend the full length of the joining edge and line up smooth and flush with adjacent surfaces. Unexposed welds do not require finish grinding, but shall have a good uniform appearance.

4. Finishing

a. Tool marks on exposed surfaces shall be dressed smooth. All surfaces shall be cleaned of rust, oil or other impurities.

b. Items shall be covered by one shop coat primer.

c. Top coat finishes and colors shall be supplied by others.

**B. Floor Mount Bench**

1. Trussbilt Model No.

a. FMB-7212

2. Materials

a. Bench top shall be constructed of 304 stainless steel.

b. Base shall be constructed of 3/8", 304 stainless steel.

c. Support tubes shall be constructed of 2-1/2" x 3/26", 304 stainless wall tube.

d. Full length hand-cuff bar, nom. 1 1/4" diam. tubing, with 2" radii returns.

### 3. Construction

- a. 72" x 12" bench top press shall be formed to provide rigidity and shall be supplied with 3/16" reinforcement plates for attaching support tubes.
- b. Support tubes shall be welded to 6" x 6" x 3/8" base plates.
- c. Base plates shall be supplied with 5/8" anchor bolt holes (anchors by others).
- d. All components shall be welded utilizing inert-gas-shielded fusion or resistance processes. Welding shall be performed by experienced welders certified to AWS D1.3. Exposed welds, as viewed from the exterior of the item, shall extend the full length of the joining edge and line up smooth and flush with adjacent surfaces. Unexposed welds do not require finish grinding, but shall have a good uniform appearance.

### 4. Finishing

- a. Tool marks on exposed surfaces shall be dressed smooth. All surfaces shall be cleaned of rust, oil or other impurities.
- b. Items shall be covered by one shop coat primer.
- c. Stainless steel (optional) shall have random orbital finish as standard.
- d. Top coat finishes and colors shall be supplied by others.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

- A. Install accessories in accordance with the manufacturer's printed instructions and ASTM F446.
- B. Install accessories plumb and level and securely anchor to substrate.
- C. Install accessories in a manner that will permit the accessory to function as designed and allow for servicing as required without hampering or hindering the performance of other devices.
- D. Position and install dispensers, and other devices in countertops, clear of drawers, permitting ample clearance below countertop between devices, and ready access for maintenance as needed.
- E. Align mirrors, dispensers and other accessories even and level, when installed in battery.

F. Install accessories to prevent striking by other moving, items or interference with accessibility

END OF SECTION

## **DIVISION 12 - FURNISHINGS**

### **SECTION 12 24 00**

#### **SOLAR SHADES**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Manually-operated custom manufactured solar screen shades at aluminum windows to be installed as listed in Section 2.02.

###### **1.02 QUALITY ASSURANCE**

A. Qualifications of Manufacturer: Firm/material producer with not less than 3 years of production experience whose published literature clearly indicates general compliance of products with requirements of this section.

B. Qualifications of Installer: Firm specializing in installation of solar screen shades with not less than 3 years of experience in installations similar to those required for this project.

C. Provide complete solar screen shades assemblies produced by a single manufacturer.

###### **1.03 SUBMITTALS**

A. Manufacturer's specifications and catalog cuts.

B. Submit written data on physical characteristics, strength, resistance to fading and fire performance requirements.

C. Submit shop drawings showing installation details at all standard and nonstandard conditions, and relationship to adjoining work.

D. Provide samples showing full range of colors, textures and patterns available for each type of component required.

###### **1.04 DELIVERY, STORAGE AND HANDLING**

A. Deliver materials to project site in original factory wrappings and containers, clearly labeled with identification of manufacturer and installation location.

B. Store materials in well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity.

## **1.05 WARRANTY**

A. Provide manufacturer's standard twenty-five (25) year limited warranty against defects in materials and workmanship, beginning at date of substantial completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURER**

A. Draper, Inc. Flexshade System.

B. No substitution.

### **2.02 MATERIALS**

A. Manual Operating System:

1. Adjustment-free system that is controlled by nickel-plated steel ball chain in polyester cord. The clutch system shall be comprised of multi-banded steel springs that create the pressure necessary to keep the shade in the desired position.
2. Mounting Brackets: Single piece able to be mounted to ceiling, wall or side. Idler and end bracket must have a lock-down retainer device to secure shade in brackets.
3. Roller Tube: Roll-formed steel or extruded aluminum, sized appropriately to minimize deflection.
4. Fabric shall be attached to roller tube using two sided adhesive tape to allow for easy adjustment of fabric leveling and removal.
5. Bottom hem of shade to be RF heat-seal pocket with heat-seal pocket with enclosed hem bar.

B. Shade Accessories:

1. Extruded aluminum fascia snaps on to the mounting brackets to conceal the hardware mechanism.
2. Extruded aluminum ceiling pocket with access flap.
3. Custom dual shade pocket to be fabricated per site requirements.
4. Extruded aluminum side tracks.

- C. Solar Screen Fabric #1: Draper Opaque Apagon Style III, blackout with 100% UV Blockage, 0% Openness Factor.
  - 1. Color: As selected by the Architect from standard range.
  - 2. Finish: Greenguard.
  - 3. For use in Bunk Rooms.
  
- D. Solar Screen Fabric #2: SheerWeave by Phifer Incorporated, Sunscreen, 75% UV Blockage, 25% Openness Factor.
  - 1. Color: As selected by the Architect from standard range.
  - 2. Finish: Greenguard.
  - 3. For use in all other locations.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and conditions under which work will be installed. Correct conditions detrimental to timely and proper completion of the work.

### **3.02 INSTALLATION**

- A. Install work in strict accord with manufacturer's recommendations, anchoring components firmly into position.
  
- B. Position units plumb and level, secured at proper height and location relative to adjoining window units and other related work.
  
- C. Isolate metal parts of shade units to concrete or mortar to prevent galvanic action.
  
- D. Field test operation of each shade unit and adjust as required to provide smooth operation.
  
- E. Protect tested and installed units to ensure optimum operating conditions without damages, blemishes or indication of use at substantial completion. Repair or replace defective units.

**END OF SECTION**

**DIVISION 12 – FURNISHINGS**  
**SECTION 12 36 61**  
**SOLID SURFACE FABRICATIONS**

**PART 1 — GENERAL**

**1.01 SECTION INCLUDES**

A. This Section includes the following horizontal and trim solid surface product types and locations:

1. Administrative area countertops.
2. Lavatory countertops in restrooms.
3. Window sills.

**1.02 DEFINITION**

A. Solid surface is defined as nonporous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum tri-hydrate filler and pigment.

**1.03 SUBMITTALS**

A. Product data: For each type of product indicated.

B. Shop drawings:

1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
  - a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
  - b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
  - c. Show locations and sizes of undermount sinks and other items installed in or through solid surface.

C. Samples:

1. For each type of product indicated.
  - a. Submit minimum 6-inch by 6-inch sample in specified gloss.

- b. Cut sample and seam together for representation of inconspicuous seam.
    - c. Indicate full range of color and pattern variation.
  2. Approved samples will be retained as a standard for work.

D. Maintenance data:

1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions.
  - a. Maintenance kit for finishes shall be submitted.
2. Include in project closeout documents.

#### **1.04 QUALITY ASSURANCE**

A. Qualifications:

1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:

1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

C. Applicable standards:

1. Standards of the following, as referenced herein:
  - a. American National Standards Institute (ANSI)
  - b. American Society for Testing and Materials (ASTM)
  - c. National Electrical Manufacturers Association (NEMA)
  - d. NSF International
2. Fire test response characteristics:
  - a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
    - 1) Flame Spread Index: 25 or less.
    - 2) Smoke Developed Index: 450 or less.

D. Coordination drawings:

1. Shall be prepared indicating:
  - a. Plumbing work.
  - b. Electrical work.
  - c. Miscellaneous steel for the general work.

- d. Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.
- 2. Content:
  - a. Project-specific information, drawn accurately to scale.
  - b. Do not base coordination drawings on reproductions of the contract documents or standard printed data.
  - c. Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
  - d. Provide alternate sketches to designer for resolution of such conflicts.
    - 1) Minor dimension changes and difficult installations will not be considered changes to the contract.
- 3. Drawings shall be produced in 1/2-inch scale for all fabricated items.

H. Pre-installation conference: Conduct conference at project site to comply with requirements in Division 1.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
  - 1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

#### **1.06 WARRANTY**

- A. Provide manufacturer's warranty against defects in materials.
  - 1. Warranty shall provide material and labor to repair or replace defective materials.
  - 2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.
- B. Manufacturer's warranty period:
  - 1. Ten years from date of substantial completion.

#### **1.07 MAINTENANCE**

- A. Provide maintenance requirements as specified by the manufacturer.

## **PART 2 — PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturer:
  - 1. Wilsonart – Engineered Surfaces distributed by Fessenden Hall Inc.
  - 2. Approved substitution.

### **2.02 MATERIALS**

- A. Solid polymer components:
  - 1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
  - 2. Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.
- B. Thickness: ½ inch unless noted otherwise.
- C. Edge treatment: Bullnose.
- E. Backsplash: Applied.
- F. Sidesplash: Applied.

### **2.03 ACCESSORIES**

- A. Cut-outs: Provide circular cut-outs where wiring or equipment is located below worksurfaces with two-piece knock-out style grommets and plugs.
- B. Joint adhesive: Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
- C. Sealant: Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.
- D. Wall Brackets: Heavy-duty steel floating countertop wall brackets with factory-drilled holes for mounting. Direct stud-mount attachment with fasteners recommended by the manufacturer. As manufactured by Centerline Steel, LLC., St. Augustine, FL 32084.

1. Size: 2-1/2" width x 1/2" thick. Length to be determined by countertop application. Unsupported countertop overhangs shall not exceed countertop manufacturer's recommendations.
2. Bracket Capacity: 200 lb.
3. Finish: powder coat. Color to be selected by the Architect.

## **2.04 FACTORY FABRICATION**

### **A. Shop assembly:**

1. 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.
2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
  - a. Reinforce with strip of solid polymer material, 2" wide.
3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
4. Rout and finish component edges with clean, sharp returns.
  - a. Rout cutouts, radii and contours to template.
  - b. Smooth edges.
  - c. Repair or reject defective and inaccurate work.

## **2.05 FINISHES**

### **A. Select from the manufacturer's standard color chart.**

1. Countertops and work surfaces: Monte Amiata 9911SS.
2. Window sills: Designer White D354SL.

### **B. Finish: Provide surfaces with a uniform finish.**

1. Matte; gloss range of 5–20.

## **PART 3 — EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

---

A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.

1. Provide product in the largest pieces available.
2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
  - a. Exposed joints/seams shall not be allowed.
3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
4. Cut and finish component edges with clean, sharp returns.
5. Rout radii and contours to template.
6. Anchor securely to base cabinets or other supports.
7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.

B. Install brackets according to manufacturer's instructions in a level plane. Reinforce all metal studs with continuous wood blocking prior to bracket installation.

### **3.03 REPAIR**

A. Repair or replace damaged work which cannot be repaired to architect's satisfaction.

### **3.04 CLEANING AND PROTECTION**

A. Keep components clean during installation.

B. Remove adhesives, sealants and other stains.

**END OF SECTION**

# **DIVISION 14 – CONVEYING SYSTEMS**

## **SECTION 14 20 00**

### **VERTICAL PLATFORM LIFT**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Commercial wheelchair lifts.

##### **1.2 RELATED SECTIONS**

- A. Division 16 Sections for electrical service for elevators to and including disconnect and fused switches at machine room.
- B. Division 16 Sections for standby power source, transfer switch, and connection from auxiliary contacts in transfer switch to controller.
- C. Division 16 Section "Voice and Data Communication Cabling" for telephone service to elevators.
- D. Section 03 30 00 - Cast-in-Place Concrete.
- E. Section 06 10 00 - Rough Carpentry.
- F. Section 08 71 00 - Door Hardware.
- G. Section 09 21 16 - Gypsum Board Systems.
- H. Section 09 65 00 - Resilient LVT Flooring.
- I. Section 09 91 00 - Painting and Coating.

##### **1.3 REFERENCES**

- A. American National Standards Institute (ANSI) B-29.2 - Chain Standards for Inverted Tooth (Silent) Chains and Sprockets.
- B. American Society of Mechanical Engineers (ASME) A17.1 - Safety Code for Elevators and Escalators.
- C. American Society of Mechanical Engineers (ASME) A18.1 - Safety Standard for Platform and Stairway Chair Lifts.
- D. CSA B44.1 - Elevator and Escalator Electrical Equipment.
- E. CSA B355 - Lifts for Persons with Physical Disabilities.

- F. CSA B613 - Private Residence Lifts for Persons with Physical Disabilities.
- G. CSA - National Electric Code.
- H. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- I. NFPA 70 - National Electric Code.
- J. U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)".

#### **1.4 REQUIREMENTS OF REGULATORY AGENCIES**

- A. Fabricate and install work in compliance with applicable jurisdictional authorities.
- B. File shop drawings and submissions with local authorities as the information is made available. Company pre-inspection and jurisdictional authority inspections and permits are to be made on timely basis as required.

#### **1.5 SUBMITTALS**

- A. Submit under provisions of Section 01 33 00 - Submittals.
- 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: Provide a complete layout of lift equipment detailing dimensions and clearances as required.
- D. Verification Samples: For each finish product specified.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: Minimum 2 years experience installing similar products, and acceptable to the manufacturer.
  - 1. Skilled tradesmen to be employees of installing contractor approved by the manufacturer, with demonstrated ability to perform the work on a timely basis.
  - 2. Must have adequate product liability insurance.

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

- A. Store products in manufacturer's unopened packaging until ready for installation.
  - B. Store and dispose of solvent-based materials, and associative materials, in
-

accordance with requirements of local authorities having jurisdiction.

## **1.8 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install systems under environmental conditions outside manufacturer's recommended limits.

## **1.9 WARRANTY**

- A. Manufacturer warranty applies to repair or replacement, of parts failing due to defective material or workmanship. Manufacturer may, provide factory reconditioned parts. Warranty is provided to Authorized Dealer on behalf of final purchaser and is not transferable. Warranty does not cover labor charges for removal, repair, or replacement. Labor costs may be covered for a period of time by Authorized Dealer's warranty, provided to purchaser separately.
  - 1. Manufacturer 36 month limited warranty on parts from date of shipment.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Savaria, Brampton, ON, Canada
- B. Approved substitutions.

### **2.2 COMMERCIAL WHEELCHAIR LIFT**

- A. Hydraulic Vertical Platform Lifts: Savaria V1504-STD.
  - B. Hydraulic Vertical Platform Lift: A hydraulic tower with a lifting platform.
  - C. Provide equipment, incidental material, and labor required for complete, operable roped hydraulic wheelchair lift installation. Erected, installed, adjusted, tested, and placed in operation by lift system manufacturer, or authorized installer.
    - 1. Standards Compliance:
      - a. ASME A18.1 and ADAAG compliant; USA.
  - D. Preparatory work to receive lifts is part of the work of other sections:
    - 1. Permanent 120 VAC, 20 amp single phase power to operate lift from lockable fused/cartridge type disconnect switch with auxiliary contacts for battery operation. Refer to drawings for power specifications and location of disconnects. Temporary power may be provided to expedite installation of lift.
    - 2. Plumb and square hoistway. Smooth interior surfaces, including fascias or furring of hoistway interior.
    - 3. Rough openings per lift contractor's shop drawings.
-

4. Substantial, level pit floor slab as indicated on lift contractor's shop drawings.
- E. Characteristics:
1. Rated Load: 750 lb (340 kg).
  2. Rated Speed: 20 fpm (0.10 m/s).
  3. Car Dimensions (WxD): 42 x 60 inches (1067 x 1524 mm).
  4. Levels Serviced: 2.
  5. Car Configuration: Front/rear exit.
  6. Pit Depth: 0 inches (0 mm) - Fixed Ramp Required.
  7. Travel: To be determined by the Architect or as stated on the Drawings.
  8. Powder Coat Finish: standard range of colors as determined by the Owner and Architect.
  9. Operation: Constant pressure.
  10. Power Supply: 110 volt, 20 amp, 1 phase, 60 Hz.
  11. Drive System: 2:1 Roller chain hydraulic.
  12. Emergency Power: 24VDC Battery raising and lowering.
  13. Controller: Relay logic based controller.
  14. Motor/Pump: 3 HP (2.24 kw), gear type.
  15. Manual Lowering: Outside the hoistway at lower landing.
- F. Car Enclosure Cab Configuration:
1. Side Guards of Platform: Enclosed cab, steel frame, powder coat finish, and steel panel inserts to 80 inches (2032 mm) above upper landing. Steel ceiling with egg crate insert and 4 x LED lights.
- G. Doors and Gates:
1. First landing door:
    - a. Door Type: 80 inches (2032 mm) high 1-1/2 hour UL/ULC fire-rated Prodoor with concealed hinges and concealed electro/mechanical interlock.
    - b. Flush closing operation with hoistway side.
    - c. Operation: Automatic; concealed 24 volt door opener with battery back-up for fire-rated door.
    - d. Door Width: 42 inches (1067 mm) clear opening.
  2. Upper Landing Door/Gate:
    - a. Door/Gate Type: 80 inches (2032 mm) high 1-1/2 hour UL/ULC fire-rated Prodoor with concealed hinges and a concealed electro/mechanical interlock.
    - b. Flush closing operation with hoistway side.
    - c. Operation: Automatic; concealed 24 volt door opener with battery back-up for fire-rated door.
    - d. Door/Gate Width: 42 inches (1067 mm).
- H. Call Stations: Flush, surface or door frame mounted landing call/send stations.

1. Key Switch: Keyed; removable in on/off position.
- I. Car Operation:
    1. Operating Panel: Constant pressure buttons, emergency stop/alarm button, on/off key switch, when applicable, and emergency LED light mounted on a removable stainless steel panel; type 304 No. 4 stainless steel finish.
    2. Auxiliary lighting: Battery operated LED light fixture. Battery to be rechargeable with automatic recharging system.
    3. Telephone: Car to be equipped with an ADA Hands free phone.
  - J. Pumping Unit and Control:
    1. Enclosed in tower. Pre-wired. Tested prior to shipment.
    2. Controller: Relay logic based operation for ease of maintenance and service.
    3. Adjustable pressure relief valve.
    4. Manually operable down valve to lower lift in event of emergency. Activated from outside of hoistway through a keyed box.
    5. Pressure gauge isolating valve, manually operable.
    6. Gate valve to isolate cylinder from pump unit.
    7. Electrical solenoid for down direction control.
    8. Emergency Operation: Manual lowering device located outside hoistway in a lockable box positioned at lower landing.
  - K. Cylinder and Plunger:
    1. Cylinder: Steel pipe of sufficient thickness and suitable safety margin. Equip top cylinder head with an internal guide ring and self-adjusting packing.
    2. Plunger: Solid steel shaft of proper diameter machined true and smooth. Provided with stop electrically welded to bottom preventing plunger from leaving cylinder.
  - L. Roller Chains: Two No. 50 roller chains with 5/8 inch (16 mm) pitch. Minimum breaking strength 6100 lb (2773 kg) each.
  - M. Leveling Device: Anti-creep device which maintains carriage level within 1/2 inch (13 mm) of each landing.
    1. Limit and Leveling Switches: To be inaccessible to unauthorized persons. Located behind mast wall and accessible through removable panels.
  - N. Guide Yoke: 2:1 supplied with idler sheaves, guide shoes, bearings, and guards.
  - O. Terminal Stopping Devices: At top and bottom of runway to stop car positively and automatically.
  - P. Steel Guide 'C' Rails and Brackets: To guide platform and sling. Rails to part

of structural integrity of unit and be integral to mast enclosure, ensuring stability and minimum platform deflection when loaded.

- Q. Car Sling: Steel tubing 44 inches (1116 mm) high with bracing to support platform and car enclosure. Roller guide shoes mounted on top and bottom of car sling to engage guide rails. Guide shoes to be roller type with 3 inches (76 mm) diameter wheels. Nylon guide shoes are not be used.
- R. Wiring and Electrical Connections: Comply with applicable codes. Insulated with flame-retardant and moisture-proof outer covering. Run in conduit or electrical wire ways if outside the unit enclosure. Use quick disconnect harnesses when possible.
- S. Materials: For exposed parts of lift.
  - 1. Walls and Ceiling: Rolled steel sheet, ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish, 16 GA; or ASTM A 240/A 240M, Type 304. Powder coat paint.
  - 2. Floor: Rolled steel sheet, ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish, 11 GA reinforced with 3/16 inch (4.7 mm) steel edge. Anti-skid grey powder coat paint.
  - 3. Outdoor Version: Zinc plated, ASTM B633 Type II Fe/Zn8.
  - 4. Hoistway Doors: Aluminum extrusion 6063 with ASTM A653 galvanized steel panels, powder coat paint.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Do not begin installation until hoistway and machine room has been properly prepared.
- B. Site dimensions shall be taken to verify that tolerances and clearances have been maintained and meet local regulations.
- C. 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 LIFT INSTALLATION**

- A. Install all the components of the lift system that are specified in this section to be provided, and that are required by jurisdictional authorities to license the lift.

- B. Trained employees of the lift contractor shall perform all installation work of this section.
- C. Adjust lift for proper operation and clean unit thoroughly.
- D. Instruct users in operation procedures and Owner's maintenance person in trouble-shooting and maintenance procedures.

### **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**

## **DIVISION 14 – CONVEYING SYSTEMS**

### **SECTION 14 24 23**

#### **HYDRAULIC PASSENGER ELEVATOR**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Hydraulic passenger elevator, complete and in place, tested and approved, as shown on the drawings and specified herein.
- B. Elevator must meet the requirements of the State of Delaware relative to controls, signaling devices, and accessibility for the handicapped, and the “stretcher code”, as applicable.

###### **1.02 QUALITY ASSURANCE**

- A. Standards:
    - 1. Comply with ANSI A17.1, National Electrical Code, and applicable State and Municipal codes, including revisions.
    - 2. All terms in this Section shall have the meaning defined in the ANSI Code.
    - 3. In all cases where a device or part of the equipment is referred to in this Section by the singular number (such as "motor"), it is intended that such reference shall apply to as many such devices as are required to complete the installation.
    - 4. FEMA Technical Bulletin 4: Elevator Installation for Buildings Located in Special Flood Hazard Areas
    - 5. ASCE 24: Flood Resistant Design and Construction
  - B. Qualifications of Subcontractor: The elevator subcontractor shall be regularly engaged in the business of manufacturing, installing, and servicing elevators of the type required by these specifications, and shall maintain a service center within 50 miles of the project site.
  - C. Qualifications of Installers:
    - 1. Provide at least one person who shall be thoroughly familiar with the specified requirements, completely experienced and trained in the necessary crafts, and who shall be present at the site and shall direct all work performed under this section.
    - 2. Provide adequate numbers of skilled personnel who are completely
-

familiar with the specified requirements and the materials and methods necessary for proper performance of the work of this section.

### **1.03 SUBMITTALS**

- A. Product Data: Within 45 calendar days after award of the contract, submit:
1. A complete list of items proposed to be furnished and installed under this section.
  2. Manufacturers' specifications, catalog cuts, and other data to demonstrate compliance with the specified requirements.
  3. Complete shop drawings of work of this section, showing dimensions and locations of all items including supporting structure and clearances are required.
  4. Samples of items of interior finish.
  5. Provide manufacturer's certifications that all elevator components comply with FEMA and NFIP requirements.

### **1.04 PRODUCT HANDLING**

- A. Protection: Use means necessary to protect materials before, during, and after installation and to protect work and materials of other trades.
- B. Replacements: In event of damage, immediately make repairs and replacements necessary at no additional cost to Owner.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

- A. Furnish and Install:
- B. Elevator 1
1. Type of Machine: Hydraulic Hole-Less, 3500H F.
  2. Load (Capacity): 3500 pounds.
  3. Car Speed: 150 feet per minute.
  4. Operation: Single car collective.
  5. Control: Across the line starting. ELEVATOR CONTROLS TO TIE INTO POLICE SECURITY SYSTEM. CALL CONTROL FROM THE FIRST FLOOR LANDING TO BE LOCKED DURING AFTER HOURS. ELEVATOR TO REMAIN OPERATIONAL, BUT CALL AND OPERABILITY LIMITED TO CARD SECURITY DURING AFTER HOURS.
  6. Travel: See plans.

7. Landings Served From: First floor landing to third floor landing.
8. Number of Openings: Three at front of hoist-way.
9. Opening Size: 3' - 6" wide by 7' - 0" high.
10. Type of Car and Hoist-way: Single slide right entrances.
11. Door Operation: Automatic, direct current powered.
12. Car Enclosure: Otis Designer Series.
13. Hoist Way Inside: Max. - See plans.
14. Height to Underside of Car Top: 8' - 0".
15. Car and Hall Operating Buttons: Mechanical-Illuminated.
16. Maintenance: Twenty four months.
17. Power Supply: 208 Volts, 3-Phase, 60 Hertz.
18. Lighting Supply: 120 Volts, Single Phase, 60 Hertz.

C. Elevator 2

1. Type of Machine: Hydraulic Hole-Less, 4500 H F+R.
2. Load (Capacity): 4500 pounds.
3. Car Speed: 150 feet per minute.
4. Operation: Single car collective, security card access required for operation.
5. Control: Across the line starting. CARD CONTROL OPERABILITY ACROSS ALL FLOORS.
6. Security: holding cage.
7. Travel: See plans.
8. Landings Served From: First floor landing to third floor landing.
9. Number of Openings: Four. Front and Rear.
10. Opening Size: 4' - 0" wide by 7' - 0" high.
11. Type of Car and Hoist-way: Single slide left and right entrances.
12. Door Operation: Automatic, direct current powered.
13. Car Enclosure: Otis Designer Series.
14. Hoist Way Inside: Max. - See plans.
15. Height to Underside of Car Top: 8' - 0".
16. Car and Hall Operating Buttons: Mechanical-Illuminated.
17. Maintenance: Twenty four months.
18. Power Supply: 208 Volts, 3-Phase, 60 Hertz.
19. Lighting Supply: 120 Volts, Single Phase, 60 Hertz.

D. Design is based on use of elevator systems provided by Otis Elevator Company, and the terminology used may include reference to that manufacturer's proprietary products. Such reference shall be construed only as establishing the quality of materials and workmanship to be used under this section and shall not, in any way, be construed as limiting competition.

E. Products used shall be those upon which design is based, or substitutions approved in advance.

F. Power supply for the elevator apparatus will be 208 V AC, 3-phase, 60 Hz. Lighting supply 120 V AC, 60 Hz.

G. Elevator types shall be "holeless" with direct acting plunger, pumping unit, storage tank, magnetic control valves, and the following:

1. Pumping unit and associated control equipment: Locate in a machine room adjacent to the hoist-way.
2. Operating fluid: Oil.
3. Pump: Deliver oil directly into cylinder at necessary pressure and in sufficient quantity to lift fully loaded elevator at specified speed.
4. Tank: For oil storage only. The oil shall be pumped from tank into cylinder on up trip, returned to tank on down trip.

## **2.02 ELEVATOR CYLINDERS AND PLUNGERS**

A. Cylinders:

1. Construct of steel piping of sufficient thickness suitable for a working pressure of 400 psi.
2. Close bottom of cylinder, and provide top with a cylinder head equipped with stuffing box and packing gland with self-adjusting packing that does not require external adjustment, so arranged as to effectively prevent leakage.
3. Coat inside of cylinder with a rust preventative coating.

B. Plunger:

1. Construct plunger of selected steel tubing of proper diameter, machined true and smooth, with a fine polished finish.
2. Provide plunger with a stop, welded to bottom to prevent plunger from leaving cylinder and secured to car frame by means of a suitable platen.
3. Install plunger and cylinder plumb, operating freely with minimum friction.

C. Safety Bulkhead: Provide as part of the cylinder construction.

D. Corrosion Protection: For protection against electrolysis, chemical soil action and corrosion, coat the cylinder with a mastic standard with the cylinder manufacturer.

E. Provide cylinder well in accord with approved shop drawings, plus casing to contain cylinder, and a field-applied glass-coated wood plug in the casing.

## **2.03 PUMPING UNIT**

A. General:

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1. Pumping Unit: Integral design, and includes electric motor direct-connected to pump through V-belt drive, control valve assemblies, and storage tank design and mounted on structural steel bedplate as single self-contained unit.
2. Mount motor and pump assembly on a rubber isolated inner base with a removable drip pan. Support tank and controller on a structural steel frame.
3. Pump: Provide positive displacement, screw-type, to give smooth operation.
4. Motor: Provide alternating current, poly-phase, squirrel cage, induction type, specially adapted to plunger elevator requirements.
5. Control Valve Assembly:
  - a. Compact design, suitable for operation under required pressures.
  - b. Isolating seal and coupling device, designed to reduce transmission of vibrations and noise to elevator car.
  - c. Metered bypass valve, check valve, relief valve, and pilot valves.
6. Operation of manual lowering valve shall permit car to be lowered at slow speed in the event power fails.

B. Storage Tank (oil reservoir):

1. Construct of welded sheet steel, and provide with a cover, a protected vent opening, oil gage, and a filtering screen mounted over suction inlet and drain connection.
2. Tank shall have a capacity equal to volume of oil required to lift elevator to top terminal, plus a reserve of not less than 10 gallons.
3. Provide an initial supply of oil sufficient for proper operation of elevator.

C. Piping: Provide necessary piping and fittings between pumping unit and cylinder head. Provide gate valve in line to facilitate maintaining and adjusting.

## **2.04 CONTROLLERS**

A. General: Provide electro-magnetic controllers, including necessary starting switches of adequate size, together with relays and switches required to accomplish specified operation

B. Overload Relay: Manual reset type, of suitable size for motor furnished.

C. Pump motor operation depends on closure of at least two separate switches in order to insure against possibility of a switch fusing closed.

## **2.05 MUFFLERS**

A. Provide blow-out proof mufflers, designed to minimize transmission of fluid pulsations, in the pipelines between pumping unit and cylinder head.

## **2.06 MISCELLANEOUS EQUIPMENT**

A. Car Stall Protective Device: In event car should stall while ascending, as the result of relay failure, valve failure, low oil in system, etc., provide a special circuit which automatically will return the car to the bottom landing, where it will be completely shut down. Service shall be restorable by recycling main line switch.

B. Sound Reduced Enclosure: Enclose lower area of power unit where motor, pump, and valves are installed. Use sheet steel panels lined with sound-deadening material to reduce air-borne noise.

C. Alarm Bell: Provide an alarm bell near hoist-way, connected to an alarm bell button in the car.

D. Wiring: Provide necessary insulated wiring and connect all parts of the equipment. All wire and traveling cables shall have a flame-retarding and moisture-resisting outer cover; run in metal conduit, metallic tubing, wire ducts, or raceways. Traveling cables shall be flexible and suitably suspended so there is no strain on individual conductors. All electrical material and work shall, as a minimum, comply with requirements of the National Electric Code.

E. Leveling Device and Automatic Re-leveling:

1. Equip each car with a floor leveling device which automatically will bring car to a stop within 6 mm (1/4") of level with any floor or which a stop has been initiated, regardless of load or direction of travel.
2. Provide an automatic re-leveling device arranged automatically to return car to the floor in event car creeps down a predetermined amount below floor level. This device shall be operative at all floors served, whether hoist-way door and car door are opened or closed.

## **2.07 HOISTWAY EQUIPMENT**

A. Guide Rails: Consist of planed steel T's having a section of not less than 15 lbs. per ft. erected plumb and securely fastened to hoist-way framing by heavy steel brackets. Tongue and groove ends of guides, forming matched joints connected with steel splice plates.

B. Buffers: Provide adequate spring buffers, mounted on pit floor or supported on the cylinder head. Block buffers up as required to protect cylinder heads and packing glands in event car should, for any reason, pass bottom limit switch setting. Provide

striker plates on underside of car frame.

## **2.08 CAR CONSTRUCTION**

A. Car Frame: Provide a suitable car frame of structural steel shapes, welded or riveted together. Bolt brace rods to structural members as required to form a thoroughly rigid structure.

B. Roller Guides:

1. Provide roller guides at top and bottom of each of the upright members of the car frame or sub-truss.
2. Provide quiet, rubber-tired ball-bearing rollers of ample diameter to run on the finished rail surfaces. Properly balance.

C. Car Platform: Structural steel frame, equipped with an aluminum threshold plate designed to accept finished flooring (carpet) provided under other sections.

D. Car Enclosure: Provide metal cars with the following attributes:

1. Car Top: 12 gage one-piece furniture steel with baked enamel finish.
2. Walls: Sides and back - Plastic laminate. Pattern as selected.
3. Entrance columns: Separate type (90 degree bends) floor-to-fascia, 14 gage stainless steel, satin finish.
4. Fascia: 14 gage stainless steel, satin finish, full width.
5. Car Door: 3'-6" x 7'-0" clear opening. 16 gage stainless steel, #3 finish.
6. Lighting: Fluorescent lighting with plastic diffuser panels.
7. Vents: In sides or bottom of car shell.
8. Emergency Exit: Provide flush-type top exit in car tops in accordance with ANSI requirements.
9. Overall Height: Floor to car top: 8'-0".
10. Emergency Car Lighting: Provide an emergency power unit employing a 12 V sealed rechargeable battery and totally static circuits, of sufficient capacity to adequately illuminate the car and provide current to the alarm bell in the event of a power failure. Comply with requirements of ANSI Code.
11. Protective Cab Pad Hooks and Pads.

E. Car and Hoist-way Door Operators:

1. Doors on car and at each hoist-way landing shall be operated quietly and smoothly by an electric operator driven by direct current motor which shall open car door and hoist-way door simultaneously.
2. The operator shall fully open and close door in a maximum time of 1'-0" per second. Cushion or check door movements at both limits of travel.

3. Provide electro-mechanical interlock at each opening to prevent operation of elevator unless doors are closed and locked.
4. Provide an electric contact on car door, which shall prevent elevator movement away from the landing unless the doors are in the closed position as defined in the "American Standard Safety Code for Elevators, Dumbwaiters and Escalators".
5. Equip each hoist-way door with a positive electromechanical interlock and auxiliary door closing device so elevator can be operated only after interlock circuit is established. Interlock operation shall comply with "American Standard Safety Code for Elevators, Dumbwaiters, and Escalators".
6. Arrange door operator so that in case of interruption or failure of electric power from any cause, doors can be operated readily by hand from within the car. Provide devices and keys for opening the doors from the landing as required by governing Code.
7. Provide car doors with a protective device extending full height and projecting beyond front edge of door while door is closing. The device shall retract as the door opens.
8. Should this device touch a person or object in its path while car doors are closing, both car door and hoist-way door shall return to the open position. Doors shall remain open until expiration of a predetermined time interval, and then shall close automatically.
9. The doors shall open automatically as the elevator is leveling, and shall close either after expiration of a time interval or the moment a car button call is registered. If desired, it shall be possible to stop or reverse the doors. In case of power interruption or failure of the operator, it shall be possible to open the doors manually from within the car.
10. Semi-selective operation: Provide each car operating panel with "Door Open" and "Door Close" buttons. As the car is about to stop in response to a landing or car button call, the corresponding hoist-way door and car door shall open, and the opposite hoist-way door and car door shall remain closed. Only the hoist-way door and car door for the landing at which the car is stopping shall open.

## **2.09 ENTRANCES**

### **A. Hollow Metal Elevator Entrances:**

1. Provide a total of 7 metal entrances. Include frames, doors, sills, fascia plates, toe guards, headers, struts and closer angles, tracks, hangers, and hardware, with the following attributes:
  - a. Unit Frames: Bolt the frames for one-piece unit assembly. Fabricate from 16 gauge stainless steel, satin finish, comprising head and jamb sections with integral casing or trim bolted to form one-piece unit frames. Securely fasten frames to sills and hanger

- supports, and return on the hoist-way side to present a neat appearance.
- b. Doors: Provide flush door construction of the type described above, with door panels formed of not lighter than 16 gage stainless steel, and all joints welded. Satin finish.
  - c. Provide bottoms of doors with removable laminated phenolic guides which run in sill slots with minimum clearance. Reinforce doors, and provide with hoist-way door unlocking devices and service keys as required by Code. Reinforce doors for separate hangers, or fabricate to include integral hangers.
  - d. Sills: Provide extruded aluminum sills with non-slip wearing surface. Grooves for door guides shall have minimum clearance for the guides.
  - e. Headers: Construct headers of sufficient size and thickness to provide support from the frame and hangers; securely bolt to strut or closer support angle.
  - f. Strut and Closer Angles: Provide angles of sufficient size to accommodate the door closers. Angles shall be continuous and securely bolted to the sills and building beams above, or bracketed from a point above the header to the guide rails.
  - g. Hardware: At entrances, include hoist-way door unlocking devices and service keys meeting Code requirements. All hardware satin finish.
  - h. All structural members shall receive a shop coat of black paint.
  - i. Erect sills, struts, hanger supports, and unit frames after erection of rough walls. Set in proper relation to the elevator car guides. Install doors, fascias, after walls are finished. Provide a protective covering for finished surfaces on unit frames.
  - j. Install watertight doors and seals at elevator entrances to prevent water ingress during flooding.

**B. Door Hangers and Tracks:**

- 1. Provide necessary hangers and tracks, complete, for each hoist-way entrance:
  - a. Hangers: Sheave type, arranged for two-point suspension of doors.
  - b. Hanger brackets: Integral with doors applied.
  - c. Sheaves: Steel, with flanged groove, and shall include resilient sound absorbing tires.
  - d. Sheaves and rollers shall include ball bearings, properly sealed to retain grease lubricants.
  - e. Provide adjustable ball bearing rollers to take up thrust of doors.
  - f. Provide cold rolled steel tracks, with surfaces shaped to conform to the tread of the hanger sheaves and rollers.

## 2.10 OPERATION

### A. Control:

1. Provide selective-collective automatic control, with flush mounted operating device, which shall include a bank of buttons numbered to correspond to the landing served, a switch for the car light, an alarm button connected to a bell which serves as an emergency signal, and an emergency stop switch. Mount single push buttons at each terminal landing and "Up" and "Down" buttons at each intermediate landing.
2. Operation shall be such that momentary pressure of car or landing buttons, other than those for the landing at which the car is standing, shall start the car, provided the interlock circuits are established, and cause the car to stop at the first landing for which a car or landing button is pressed corresponding to direction in which the car is traveling.
3. The car shall stop at all landings for which calls are registered, and these stops shall be made in the order in which the landings are reached, irrespective of the sequence in which buttons are pressed, provided the button for a given landing is pressed sufficiently in advance of arrival of the car at that landing to permit the stop to be made.
4. If no car buttons are pressed, and the car starts up in response to several "Down" calls, the car shall proceed first to the highest "Down" call and then reverse to collect the other "Down" calls. "Up" calls shall be collected similarly when the car starts down in response to such calls. If the car stops for a landing call, and a car button is pressed within a predetermined interval after the stop for a landing corresponding to the direction the car was traveling, the car shall proceed in the same direction regardless of other landing calls registered.
5. If "Down" landing buttons are pressed while the car is traveling up, the car shall not stop at those landings, but those calls shall remain registered. After the highest car and landing calls have been answered and the door interlock circuit is established, the car shall reverse automatically and respond to "Down" car and landing calls. When traveling down, the car shall not respond to "Up" landing calls, but such calls shall remain registered and be answered on the next up trip.
6. A time limit relay shall hold the car for a few seconds at landings at which stops are made, to enable passengers to enter or leave the car. Pressure of a car button for another landing before this time elapses shall cause the car to start, provided car door and hoist-way door are closed. When the car has answered the farthest call, this interval shall permit a car button call to be registered to establish direction of car travel, even though a landing button call may be registered already for opposite direction of travel.

B. Emergency stop switch shall interrupt the power supply. Opening emergency stop switch shall not cancel registered calls, and after switch is closed, car shall continue to answer those calls.

## **2.11 OTHER EQUIPMENT**

A. Car and Hall Buttons: Provide call and hall call buttons having integral illumination, which shall light upon registration of call and extinguish only when that call is answered.

B. Car Position Indicators: Provide indicator in each car consisting of a finished faceplate with glass numerals, with a light bulb behind. Illumination of the bulb shall indicate position of the car. Include direction arrows.

C. Telephone Cabinets: Provide a stainless steel telephone cabinet in the car, complete with traveling cable and connections. Telephone instrument will be furnished by others and is not in this Contract.

D. Sump Pumps and Drains: Install sump pumps with backup power to remove water from the elevator pit during and after a flood event. Ensure proper drainage is provided to direct water away from the elevator shaft.

## **2.12 MAINTENANCE**

A. In addition to required maintenance and protection during construction, provide maintenance on the entire work of this section for a period of 90 days commencing on the day the work of this section is approved by the Delaware Division of Elevator Safety Inspection. Maintenance shall include, but not necessarily be limited to:

1. Systematic examination, adjustment, and lubrication of elevator equipment.
2. Repair or replacement of electrical and mechanical parts of elevator installation as required, using only genuine standard parts approved for the original installation.
3. Maintenance work as required during regular working hours and regular working days, but with emergency callback service available at all times during this maintenance period.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

A. Examine the areas and conditions under which work will be performed. Correct

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conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

A. Install work in strict accord with approved shop drawings, original design, FEMA/NFIP guidelines, and pertinent regulations and codes, anchoring components firmly into position for long life under hard use.

B. Construct the elevator shaft and pit using flood-resistant materials and methods as specified in FEMA Technical Bulletin 4. Apply waterproofing and sealants to prevent water ingress into the shaft and pit.

C. Ensure the hydraulic pump, controller, and other critical components are elevated above the BFE or properly protected against flood damage.

### **3.03 TESTING**

A. Upon completion of the installation, and as a condition of its acceptance, provide all necessary equipment and personnel and perform all tests required. Secure all required approvals from agencies having jurisdiction.

**END OF SECTION**

## **DIVISION 31 – EARTHWORK**

### **SECTION 31 10 00**

#### **SITE CLEARING**

##### **PART 1 - GENERAL**

###### **1.01 DESCRIPTION**

A. The Contractor shall remove existing trees, debris, and vegetation as necessary for construction of new work. The Contractor shall remove and relocate existing trees as designated on plans and as directed by the Architect.

B. Clearing and grubbing shall consist of clearing, grubbing, removing and disposing of all vegetation and debris as designated on the drawings and as necessary for construction of new work. This work shall also include the preservation from injury of defacement of all vegetation, trees, and objects designated to remain.

C. Removing paving, improvements, or other obstructions which will interfere with new construction.

D. The Contractor shall strip site of topsoil and organic matter to a minimum depth of six (6) inches where affected by grading for buildings, paved areas, and where indicated. Stockpile topsoil where indicated.

###### **1.02 QUALITY ASSURANCE**

A. Codes, Standards: Perform work in compliance with applicable requirements of governing agencies having jurisdiction.

##### **PART 2 - PRODUCTS**

###### **2.01 REMOVALS**

A. The Contractor shall perform the work of clearing and grubbing so as to remove only material herein specified and, if he chooses to do such work with mechanical equipment and removes suitable material required on the project, and suitable material removed with the cleared and grubbed material shall be replaced by the Contractor at his own expense. All materials removed by the clearing and grubbing operation shall be removed from the project or otherwise disposed of as specified or directed by the Architect.

B. The Architect shall designate any vegetation which is not to be removed and the Contractor shall protect them from any damage. If any such vegetation is damaged, they shall be replaced or repaired at the Contractor's expense.

C. All tree, debris, vegetation, or other material to be removed shall become the property of the Contractor and all materials removed in accordance with these requirements shall be salvaged or disposed of out of sight. Any burning shall be done within the requirements of State or local laws or regulations and be under complete control at all times.

### **PART 3 – EXECUTION**

A. Preparation of Ground Surface: Grading operations shall not be started in any area until all operations of clearing and grubbing within the affected area have been completed. In areas where excavation is to be made, the ground shall be cleared of all living or dead trees, stumps, brush or other objectionable material. All embedded stumps, root mats, etc. shall be removed to a depth of not less than 2' below the subgrade or slope surfaces. All depressions made below the subgrade or slope surfaces by the removal of stumps or roots shall be backfilled with approved material and compacted as directed.

B. In areas where embankment is to be 5' or more in depth, trees and stumps shall be cut off as close to the ground as is practicable, but not to exceed 6' above the ground surface. Near the toe of embankment slopes, no stump shall extend above a point 1' beneath the slope surface.

C. Areas where embankment is to be made less than 5' deep, all trees, stumps, roots, brush, root mat and debris shall be removed, grubbed or blasted from the ground and all these materials shall be grubbed in the manner required where excavation is to be made.  
Not used.

**END OF SECTION**

## **DIVISION 31 - EARTHWORK**

### **SECTION 31 22 13**

#### **SITE PREPARATION AND ROUGH GRADING**

##### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

A. Includes the furnishing and use of equipment and labor required for clearing and grubbing, topsoil stripping, and rough grading.

B. Related Work Specified Elsewhere:

1. Section 31 10 00 - Site Clearing
2. Section 31 23 16 - Structural Excavation, Backfill and Compaction
3. Section 31 23 18 - Utility Excavation, Backfill, and Compaction
4. Section 31 25 00 - Erosion and Sediment Control

##### **1.02 QUALITY ASSURANCE**

A. Tests and Inspections:

1. Tests and inspections will be performed by an independent testing agency employed by the Owner. Work of the testing agency includes but is not limited to:
  - a. Verification of subgrade suitability prior to fill placement.
  - b. Monitor fill placement and compaction operations.
  - c. Prior approval of material used as fill and backfill.
  - d. Verification of compaction by in-place density tests.
2. Contractor shall provide access for and shall assist testing agency in acquisition of samples and performance of tests involving equipment outside the normal equipment used by the testing agency. Such assistance provided by the Contractor shall be accomplished at no cost to the Owner.

B. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

C. Reference Standards:

1. American Association of State Highways and Transportation Officials:
  - a. AASHTO T 180, Moisture-Density Relations of Soils, using a 10-lb. Rammer and an 18-in. Drop

- b. AASHTO T 191, Field Determination of Density of Soil in Place.
2. American Society for Testing and Materials: ASTM D 2167, Density of Soil in Place by the Rubber-Balloon Method.

### **1.03 JOB CONDITIONS**

#### **A. Environmental Requirements:**

1. Do not perform grading when soil or weather conditions are unsuitable. Unsuitable conditions include moisture saturated or frozen in place soil and precipitation of any kind present on the soil or occurring during the work.
2. Exercise the necessary means and methods to control dust on the site as well as in the off-site work areas where excavation and grading are required.
3. Do not leave the site in a dusting condition following the work of this Section. If necessary, employ a watering schedule to control the dust.
4. Do not use frozen material in performing the work or place materials on frozen surfaces.
5. When it is necessary to haul soft or wet soil material over roadways, use suitably tight vehicles to prevent spillage. Clear away spillage of materials on roadways caused by hauling at no expense to the Owner, County or State.
6. Plan work so as to provide adequate protection during storms with provisions available at all times for preventing flood damage.

#### **B. Protection:**

1. Assume all risks attending the presence or proximity of overhead or underground utilities, pipes and conduits.
2. Complete responsibility for replacement and restitution work of whatever nature to the above, as damaged or destroyed by work of this Contract, rests solely with the Contractor and at no expense to the Owner.

**C. Excess Materials:** No right of property in materials is granted the Contractor of excess on-site materials prior to completion of site work. This provision does not relieve the Contractor of his responsibility to remove and dispose of surplus excavated materials. Unsuitable material such as sod, stumps and spongy soil as well as excess hard consolidated materials shall also become the property of the Contractor and shall be disposed of legally off-site.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. Fill Material: On-site excavated soil materials free of topsoil, plant life, lumber, metal, refuse and rock. Borrow hauled to the job site shall be approved by the Engineer prior to hauling to the site and shall meet the requirements set forth for on-site fill material.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. Clearing and Grubbing: Grub and clear surface and remove surface materials of whatever nature over pipe trenches, structure sites and areas to be graded, paved or repaved.

B. Salvaged Topsoil: Within the areas indicated for grading, strip turf and topsoil to the depth of suitable topsoil material and stockpile for subsequent topsoiling operations.

C. Stockpiling: Place topsoil storage piles within the limits of the project, and at locations not interfering with the prosecution of work.

D. Proofrolling: After grubbing and stripping is accomplished throughout, exposed subgrade in areas to receive fill or where structures or pavement will be located at grade shall be proofrolled with vibratory roller to provide surficial densification and to locate any near surface pockets of soft or loose soils. Unsuitable materials so exposed shall be suitably densified or otherwise removed and refilled as directed by the Engineer.

### **3.02 PERFORMANCE**

A. Rough Grading: Cut and fill to within 0.2 foot of the correct subgrade elevations. Set elevation of top of subgrade under paved areas to bottom of the pavement base. Set elevation of the top of subgrade under areas to receive topsoil, 4 inches below finished grades.

B. Fill:

1. Fill material shall be placed and spread in uniform, near horizontal layers, not exceeding 8 inches in thickness, prior to compaction. Each layer shall be thoroughly tamped or rolled by means of approved compaction equipment.
2. The Contractor shall add sufficient water during tamping and rolling to assure complete consolidation of fill material. If material is too wet for

satisfactory compaction, it shall be allowed to dry as required, prior to compaction. In general, moisture content should be maintained within 2 percent of optimum value depending on soil type and required compaction.

3. If sufficient fill material is not available from excavation, additional borrow material shall be imported. Borrow material shall be sand, gravel, silty sand or combination thereof. Borrow material shall be free of topsoil, plant life, lumber, metal, refuse and rock or similar hard objects. Such imported fill shall be of consistent type and quality, as approved by Engineer.

C. Compaction:

1. Fill materials in structural and pavement areas shall be compacted to a minimum dry density of 95 percent of the maximum dry weight density as determined by the Modified Proctor Test, ASTM D1557 or AASHTO T-180, Method A. Structural and pavement subgrade in cut areas shall be densified to the same degree of compaction. Fill material in landscape or other non-structural areas shall be compacted to a minimum dry density of 90 percent of optimum.
2. Compaction shall be accomplished with approved equipment. The equipment shall make sufficient passes to ensure that the required density has been uniformly obtained.
3. Each layer of fill shall be inspected, tested and approved by testing agency prior to placement and compaction of next lift.

D. Excavation of ditches and swales shall include shaping and finishing of earth bottom and slopes to the line and grade indicated. Care shall be taken not to over-excavate. Excessive ditch and swale excavation shall be backfilled with suitable material at no cost to the Owner. In no case shall excavated material be placed within 3 feet of top of bank. Excavation shall be maintained free from detrimental quantities of leaves, brush, sticks, trash and other debris until final acceptance.

**END OF SECTION**

# **DIVISION 31 – EARTHWORK**

## **SECTION 31 23 00**

### **EARTH MOVING**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Excavating, filling and grading as required.

##### **1.02 QUALITY ASSURANCE**

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

B. The Contractor shall employ certified independent testing agency to inspect, sample, classify and test as necessary, all materials to be used for fill or backfill. Tests shall include maximum density, optimum moisture content and other information required for checking the content and performance of materials. The results of these tests shall be made available to the Architect and the Owner for approval and evaluation purposes. Contractor shall submit a testing plan to the Architect prior to construction.

##### **1.03 SITE CONDITIONS**

A. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

1. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Environmental Requirements:

1. Do not perform grading when soil or weather conditions are unsuitable. Unsuitable conditions include moisture saturated or frozen in placed soil, and precipitation of any kind present on the soil or occurring during the work.
2. Exercise the necessary means and methods to control dust on the site (and in any off-site work areas) where excavation and grading are required.
3. Do not leave the site in a dusting condition following the work of this

- Section. If necessary, employ a watering schedule to control the dust.
4. Do not use frozen material in performing the work. Do not place materials on frozen surfaces.
  5. When it is necessary to haul soft or wet soil material over roadways, use suitably tight vehicles to prevent spillage. Spillage of materials on roadways shall be cleaned and removed at no expense to the Owner.
  6. Plan work so as to provide adequate protection during storms with provisions available at all times for preventing flood damage.

C. Existing Utilities:

1. Locate existing utilities in the area of work. Should uncharted, or incorrectly charted material be encountered during excavation, notify the Architect immediately. Contact "Miss Utility" a minimum of 48 hours prior to initiation of work for assistance in locating existing utilities. Call applicable local agencies if they are not participants in "Miss Utility." If existing utilities are to remain in place during construction, provide adequate means of protection.
2. Assume all risks attending the presence or proximity of overhead or underground utilities, pipes and conduits.
3. Complete responsibility for replacement and restitution work of whatever nature to the existing utilities, as damaged or destroyed by work of this Contract, rests solely with the Contractor and at no expense or exposure to the Owner.

## **PART 2 - PRODUCTS**

### **2.01 SOIL MATERIALS**

A. Subgrade Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand, as acceptable to the Architect.

B. Backfill and Fill Materials: Provide soil materials for backfill and fill which are free of clay, rock, or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, organic, and other deleterious matter similar to existing topsoil.

C. Contractor shall be permitted to use excavated soil as fill following approval by Engineer.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

A. Carefully examine work areas and the conditions under which excavating, filling, and grading are to be performed.

### **3.02 EXCAVATION**

A. Excavation includes removal and relocation of material encountered when establishing required grade elevations.

B. Unauthorized excavation consists of removal of materials beyond indicated limits shown on Drawings without specific direction of the Architect.

C. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by the Architect.

D. Stability of Excavations: Slope side of excavations to comply with codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions or stability of material excavated.

E. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and crossbraces, in a good serviceable condition.

F. Dewatering: Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.

1. Do not allow water to accumulate in excavations. Remove water to prevent softening of cuts and soil changes detrimental to stability of subgrades. Provide and maintain pumps, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
2. Convey water removed from excavations, and rain water, to collection areas tributary to approved erosion and sediment control measures. Discharge water only to stabilized surfaces. Provide and maintain temporary drainage ditches and other diversions outside excavation limits. Comply with applicable sediment control measures. Do not use trench excavations as temporary drainage ditches.

G. Material Storage: Stockpile satisfactory excavated materials in designated stockpile areas, until required for backfill or fill. Place grade and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations.
2. Dispose of excess soil material and waste materials as specified hereinafter.

H. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from foundations to

permit placing and removal of concrete formwork, installation of services, other construction required and for inspection. In excavating for foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete is placed. Trim bottoms to required lines and grades to leave solid base to receive concrete.

I. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations, and grades as shown. Proof roll to check for soft pockets. Remove soft material and replace with suitable, well compacted fill.

J. Removal of Unsatisfactory Soil Materials: Excavate unsatisfactory soil materials encountered that extend below required elevations, to additional depth as directed by the Architect.

### **3.03 BACKFILL AND FILL**

A. General: Place satisfactory excavated or borrow material in compacted layers to required subgrade elevations, or final elevations.

B. Backfill excavations as promptly as work permits but not until completion of the following:

1. Acceptance by Architect of construction below finish grade including, where applicable, dampproofing, and foundation drain.
2. Inspection, testing, approval, and recording locations of underground utilities.
3. Removal of concrete formwork.
4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.
5. Removal of trash and debris.

C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

1. When existing ground surface has a density less than that specified under "Compaction" for the particular area classification, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

D. Placement and Compaction: Place backfill and fill materials in layers not more than 8 inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content. Compact each layer to required percentage of maximum density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

1. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately the same elevation in each lift.

### **3.04 GRADING**

A. General: Uniformly grade areas within project limits including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:

1. Grassed Areas: Finish areas to receive topsoil to a tolerance of 0.10' above or below the required subgrade elevations.
2. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below the required subgrade elevations.
3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 0.05' above or below the required subgrade elevation.

C. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 0.02'.

D. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

### **3.05 COMPACTION**

A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification.

B. Percentage of Maximum Density Requirements: Provide not less than the following percentages of maximum density of soil material compacted at optimum moisture content, as measured by AASHTO-T-180, for the actual density of each layer of soil material-in-place as measured by AASHTO-T-191.

1. Structures and building slabs: Compact top 6 inches of subgrade and each layer of backfill or fill material at 95% maximum density.
2. Lawn or Unpaved Areas: Compact top 12 inches of subgrade and each

layer of backfill or fill material at 90% maximum density.

3. Walks and Pavements: Compact top 12 inches of subgrade material at 98% maximum density and each layer of backfill or fill material at 95% maximum density.

C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

D. Upon completion of backfill and testing in any area under the contract, Owner may take supplemental test to determine degree of compaction of backfill material. If results of tests indicate density less than specified, the Contractor shall, at his own expense, pay for the test cost and remedy condition as directed. If soil tests indicate satisfactory compaction, the Owner will pay for said tests.

### **3.06 ADJUSTING MANHOLES AND CATCH BASINS**

A. All existing manhole frames and covers, catch basin frames and grates, within disturbed area, shall be adjusted to grade, as necessary, prior to any paving operations or final grading.

B. Manhole and catch basin frames and covers or grates, shall be carefully removed, cleaned and reset at proper elevations, using materials conforming to the original construction or as detailed on the plans or specified herein.

C. All manhole frames and covers in paved areas, shall be set flush with, or up to, 1/8 inch below the proposed surface. All catch basin frames and grates, in paved areas or gutters, shall be depressed 1/2 to 1 inch below proposed surface, to assure positive drainage.

D. The cost of adjusting manholes and catch basins will not be paid for separately, but shall be included in the lump sum price for sitework.

### **3.07 MAINTENANCE**

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion, and keep free of trash and debris.

1. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

### **3.08 DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Remove excess materials from the Owner's property and legally dispose of it.

**END OF SECTION**

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## **DIVISION 31 – EARTHWORK**

### **SECTION 31 23 16**

#### **STRUCTURAL EXCAVATION, BACKFILL AND COMPACTION**

##### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

A. The Contractor shall excavate, sheet, shore, dewater, backfill and compact all structural excavations necessary for constructing the work under this Contract. The Contractor shall furnish all labor, materials and equipment necessary for completion of the work, all in accordance with these specifications.

B. Related work specified elsewhere:

1. Section 02 30 00 - Subsurface Exploration.
2. Section 31 23 19 - Dewatering.
3. Section 31 40 00 - Sheet piling, Shoring and/or Bracing.
4. Section 31 25 00 - Erosion and Sediment Control.

C. Definitions:

1. Excavation: Materials of any kind in the excavation.
2. Excavation Below Subgrade: Same as "Excavation" except such excavation is performed below elevations given as subgrade.
3. Subgrade: Subgrade under footings, foundations or slabs shall be as indicated on the Contract Drawings. Where no subgrade is shown, it shall be considered as the planned bottom of footings, foundations or slabs or gravel bedding shown on the Drawings.

##### **1.02 QUALITY ASSURANCE**

A. Tests and Inspections:

1. The Engineer may, at his discretion, direct that Proctor and field density testing be done to determine the degree of compaction.
2. Tests and inspections will be performed by an independent testing agency employed by the Contractor. Work of the testing agency includes but is not limited to:
  - a. Inspection of foundation excavations and verification of subgrade suitability.
  - b. Prior approval of material used as fill and backfill.

- c. Verification of compaction by in-place density tests.
3. Contractor shall provide access for and shall assist testing agency in acquisition of samples and performance of tests involving equipment outside the normal equipment used by the testing agency. Such assistance provided by the Contractor shall be accomplished at no cost to the Owner.
4. Whenever test results indicate compaction densities less than specified, subsequent re-testing occasioned by the initial non-compliance shall be performed by the same testing agency and all costs thereof shall be borne by the Contractor.

B. Reference Standards:

1. American Association of State Highways and Transportation Officials (AASHTO):
  - a. T 180: Method A: Moisture-Density Relationship; Modified Proctor Test.
  - b. T 191: Density By Sand Cone.
  - c. T 224: Coarse Particle Correction.
  - d. T 238: Density By Nuclear Methods.
  - e. T 239: Moisture Content by Nuclear Methods.
  - f. T 272, Method C: Moisture-Density Family of Curves.

### **1.03 SUBMITTALS**

- A. Samples: Submit aggregate samples to the Engineer.
- B. Submit sources of supply for approval by Engineer.

### **1.04 JOB CONDITIONS**

A. Environmental Requirements:

1. Do not perform excavating, backfilling or compacting when weather condition or materials are such that, in the opinion of the Engineer, work cannot be performed satisfactorily.
2. Do not use frozen materials as backfill nor wet materials containing moisture in excess of the amount necessary for satisfactory compaction.
3. Prior to use, moisten dry backfill material not having sufficient moisture to obtain satisfactory placement or compaction.
4. Prior to use, dry wet backfill material to a sufficient moisture to obtain satisfactory placement or compaction.
5. Accommodation of Drainage: Keep sewers, drains and ditches open for surface drainage. No damming or ponding of water in gutters or other waterways will be permitted. Do not direct flow of water across or over pavements except through approved pipes or properly constructed troughs. Provide pipes or troughs of such sizes and lengths as may be required.

Control grading in the vicinity of excavations so the ground surface is properly pitched to prevent water running into excavated areas. Plan work so as to provide adequate protection during storms with provisions available at all time for preventing flood damage. Protect installed piping and other work at all times against damage from uplift due to high ground water levels.

6. Pumping: Dewatering shall be accomplished in accordance with Section 31 23 19 - Dewatering.
7. Control groundwater and surface water during construction in order to maintain soil stability. Maintain the water table elevation sufficiently below the levels of excavation so that slopes will remain stable and bottoms of excavations will not become loosened by flow of water. If the foundation material loses its strength due to improper dewatering techniques, over excavate the material and replace it with Special Backfill at the Contractor's expense.

B. Protection:

1. The Contractor shall, at his own expense, sustain in their places, and protect from direct or indirect injury, all pipes, walls, buildings, and other structures or property in the vicinity of his work, whether above or below ground, or that may appear in the excavation. He shall at all times have a sufficient quantity of timber and plank, chains, ropes, and other material and equipment, on the ground and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened.
  - a. Perform sheeting and shoring in accordance with Section 31 40 00 - Sheeting, Shoring and/or Bracing.
2. The Contractor shall take all risks attending the presence or proximity of pipes, poles, wires, walls, buildings, and other structures and property, of every kind and description, in or over his excavation, or in the vicinity of his work, whether above or below the surface of the ground; and he alone shall be responsible for all damages and assure all expense for direct or indirect injury, caused by his work, to any of them, whether such structures are or are not indicated on the Contract Drawings.
3. The Engineer reserves the right under such conditions to stop the excavation or any other part of the work, and to require the Contractor to complete the structure and the backfilling up to such a point as the Engineer, without assuming responsibility for safety to persons or property may require before proceeding further with the excavation; and the Contractor shall not thereby become entitled to demand or to receive any allowance or compensation, other than an extension of the contract time for as many days as the Engineer may determine that the work was delayed by such stoppage.

C. Responsibility for Condition of Excavation: The Contractor shall solely be responsible for the condition and results of excavations made by him. Slides and cave-ins shall be

removed without extra compensation at whatever time and under whatever circumstances they may occur.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. General: No right of property in materials is granted the Contractor of excavated materials. This provision does not relieve the Contractor of his responsibility to remove and dispose of surplus excavated material.

B. Gravel/Stone Bedding: Stone or gravel in accordance with the Delaware Department of Transportation Standard Specifications. See Pipe Bedding: 601.03.2, Section 601.

C. Structural Backfill: Suitable soil free of topsoil, plant life, lumber, metal refuse and rock or similar hard objects.

D. Special Backfill: All requirements contained above for Structural Backfill shall apply to Special Backfill.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. Subgrade Preparation: Areas on which bedding layers are to be placed shall be trimmed and dressed to conform to cross sections shown on the Drawings, within an allowable tolerance of +1 inch from the theoretical slope lines and grades. Where such areas are below the allowable minus tolerance limit, they shall be brought to grade by filling with earth similar to the adjacent material and well compacted or by filling with well compacted bedding material. No additional payment will be made for any material thus required. No bedding shall be placed upon a frozen surface; no snow, ice, or any frozen material shall be incorporated in the bedding. The prepared base shall be inspected immediately prior to placing the bedding, and no material shall be placed thereon until that area has been approved.

### **3.02 PERFORMANCE**

A. Excavation:

1. General:

a. Perform excavation using machinery, except that hand excavation may be required where necessary to protect existing structures or buried utilities. No additional compensation will be paid for hand

excavation instead of machine excavation as may be necessary from any cause whatsoever.

- b. Perform excavation of every description and of whatever substances encountered to the lines and grades or depths indicated by the Drawings and as specified herein.
  - c. Where work space is limited, remove excavated material from the limited area and replace the material after the structure has been installed. No additional compensation will be made for such removal and replacement.
2. Excavation Below Subgrade:
- a. Do not excavate below depths indicated on the Drawings or such depths as required by the Engineer.
  - b. Excavation below depths indicated on the Drawings, through the fault of the Contractor, shall be restored to the indicated or required depths with special backfill at the expense of the Contractor.

B. Backfilling:

1. General
- a. Perform backfilling using machinery, except that hand backfilling may be required where necessary to prevent displacing walls, foundations or buried utilities or damage to such. No additional compensation will be paid where backfilling by hand is required.
  - b. After completion of footings and walls and the removal of forms and prior to backfilling, clean excavation free of trash and debris.
2. Gravel Bedding: Where gravel bedding is indicated on the Contract Drawings to be used as a subbase under slabs, footings or foundations, spread backfill uniformly without segregation of coarse and fine material. Thoroughly compact material to the satisfaction of the Engineer with a vibrator compactor. Where more than six inches of aggregate is required, place aggregate in six (6) inch layers and thoroughly compact each layer with a vibratory compactor to the satisfaction of the Engineer.
3. Structural Backfill: Includes all other areas requiring backfill.
- a. Place backfill in horizontal layers not exceeding eight (8) inches in depth, moistened if required and compact by hand or mechanical tampers to a density of not less than 95 percent of the maximum dry weight density, in accordance with the testing procedures of Modified Proctor Test AASHTO T-180, Method "A".
  - b. No fill or other load shall be placed on or against concrete surfaces before expiration of the minimum period after placing the concrete, as indicated below, unless otherwise specified.
    - (1) Walls and vertical faces 14 days
    - (2) Horizontal footings 14 days
    - (3) After the minimum period specified above has elapsed, fill operations may be initiated. Within 3 feet (measured horizontally) of walls and vertical or near-vertical faces and within 5 feet (measured vertically) of horizontal footings, no

hauling equipment will be permitted and all compaction shall be by approved power tampers. Any damage to structures caused by the Contractor's equipment shall be repaired to the satisfaction of the Engineer without cost to the Owner.

C. Cleanup: Excess excavated material that cannot be used at the project site shall be removed and disposed of off the site in a legal manner at no additional expense to the Owner.

**END OF SECTION**

## **DIVISION 31 – EARTHWORK**

### **SECTION 31 23 18**

#### **UTILITY EXCAVATION, BACKFILL AND COMPACTION**

##### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

A. This work shall consist of all excavation necessary to open the pipe or conduit trench, lay the pipe or conduit, and backfill and compact to the existing or proposed grade as required by the Contract Drawings.

B. Related Work Specified Elsewhere:

1. Section 02 30 00 - Subsurface Exploration.
2. Section 31 23 19 - Dewatering.
3. Section 31 40 00 - Sheet piling, Shoring and Bracing.
4. Section 31 25 00 - Erosion and Sediment Control.

C. Definitions:

1. All excavation for this Contract is unclassified. Items involved in the excavation such as grassed areas and sidewalks, of whatever material will be considered as unclassified excavation, and no extra payment will be made for removal.
2. Excavation: Removal of materials of any kind in the excavation.
3. Excavation Below Subgrade: Same as excavation except such excavation is performed below elevations given as subgrade.
4. Subgrade: Trench bottom prepared as specified to receive gravel bedding, concrete cradle or concrete encasement or the bottom of excavations prepared to receive pipe line structures.

##### **1.02 QUALITY ASSURANCE**

A. Tests and Inspections:

1. The Engineer may, at his discretion, direct that Proctor and field density testing be done to determine the degree of compaction.
2. Tests and inspections will be performed by an independent testing agency selected and paid by the Contractor. Work of the testing agency includes but is not limited to:
  - a. Prior approval of material used as fill and backfill.

- b. Verification of compaction by in-place density tests.
- c. Contractor shall provide access for and shall assist testing agency in acquisition of samples and performance of tests.
- 2. Contractor shall provide access for and shall assist testing agency in acquisition of samples and performance of tests.
- 3. Whenever test results indicate compaction densities less than specified, the Contractor shall correct the installation and retest until satisfactory results are achieved. All costs thereof shall be borne by the Contractor.

**B. Reference Standards:**

- 1. American Association of State Highway and Transportation Officials (AASHTO):
  - a. T 180, Method A: Moisture-Density Relationship; Modified Proctor Test.
  - b. T 191: Density By Sand Cone.
  - c. T 224: Coarse Particle Correction.
  - d. T 238: Density By Nuclear Methods.
  - e. T 239: Moisture Content By Nuclear Methods.
  - f. T 272: Method C: Moisture-Density Family of Curves.

**1.03 SUBMITTALS**

- A. Samples: Submit aggregate samples to the Engineer.
- B. Submit sources of supply for approval by the Engineer.

**1.04 JOB CONDITIONS**

- A. Environmental Requirements:
  - 1. Do not perform trenching, backfilling or compacting when weather conditions or the condition of materials are such, in the opinion of the Engineer, that work cannot be performed satisfactorily.
  - 2. Do not use frozen materials as backfill nor wet materials containing moisture in excess of the amount necessary for satisfactory compaction.
  - 3. Prior to use, moisten dry backfill material not having sufficient moisture to obtain satisfactory placement or compaction.
  - 4. Prior to use, dry wet backfill material to a sufficient moisture to obtain satisfactory placement or compaction.
  - 5. Plan work so as to provide adequate protection during storms with provisions available at all time for preventing flood damage. Protect installed piping and other work at all times against damage from uplift due to high ground water levels.
  - 6. Accommodation of Drainage: Keep gutters, sewers, drains and ditches open at all times for surface drainage. No damming or ponding or water in

gutters or other waterways will be permitted. Do not direct water flows across or over pavements except through approved pipes or properly constructed troughs. When so required, provide pipes or troughs of such sizes and lengths as may be required, and place the same as required at no expense to the Owner. Perform grading in the vicinity of trenches so that the ground surface is properly pitched to prevent water running into the trenches.

7. Pumping: Dewatering shall be accomplished in accordance with Section 31 23 19 - Dewatering.

B. Removal of Obstructions:

1. Except for items specifically noted to be removed or relocated, if the position of any pipe, conduit, pole, or other structure above or below ground be such as in the opinion of the Engineer to require its removal, realignment, or change due to work to be done under the Contract, the work of removal, realignment, or change will be done as extra work unless noted as a part of a lump sum item, or will be done by the Owner of the obstructions without cost to the Contractor; but the Contractor shall uncover and support such structures at his own expense before such removal, and before and after such realignment or change as a part of the contract; and the Contractor shall not be entitled to any claim for damage or extra compensation on account of the presence of said structure or on account of any delay in the removal or rearrangement of same.
2. The Contractor shall not interfere with any person, firms, or corporations or with the Owner in protecting, removing, changing, or replacing their pipes, wires, conduits, poles, or other structures; but he shall suffer said persons, firms, or corporation or the Owner to take all such measures as they may deem necessary or advisable for the purpose aforesaid; and the Contractor shall thereby be in no way relieved of any of his responsibilities under the Contract.

C. Protection:

1. Assume all risks attending the presence or proximity of overhead or underground utilities, pipes, conduits, existing structures, and property of whatever nature. Damages and expenses for direct or indirect injury to such structures or to any person or property by reason of them or by reason of injury to them; whether such structures are or are not shown on the Drawings, by work of this Contract, rests solely with the Contractor.
2. Pipe Supports: Adequately support underground pipes or conduits exposed as a result of excavations. Provide adequate support along their entire exposed length by salt treated timber or planking. Install such supports in such manner that backfilling may be performed without dislodging such pipes or conduits. Place and carefully compact material from excavation or Special Backfill, as required, around the supports, and leave such supports

in place as a guard against breakage due to backfill settlement. No additional payment will be due the Contractor for support material left in place nor for the labor of installing and maintaining supports.

D. Excavation Condition:

1. Condition and results of excavation are solely the responsibility of the Contractor. Remove slides and cave-ins at whatever time and under whatever circumstance they occur.

E. Change of Trench Location:

1. In case the Engineer shall direct that the location of a trench be changed to a reasonable extent from that shown on the drawings on account of the presence of an obstruction or from other cause or if a changed location shall be authorized upon the Contractor's request, the Contractor shall not be entitled to extra compensation or to a claim for damage provided that the change is made before the excavation is begun. If, however, such change made at the direction of the Engineer involves the abandonment of excavation already made, such abandoned excavation together with the necessary refill will be classed as miscellaneous excavation and refill. In the event that the trench is abandoned in favor of a new location at the Contractor's request, the abandoned excavation and refill shall be at the Contractor's expense.

F. Trench Work for Electrical:

1. Refer to Division 26 of these Specifications.
2. Requirements specified herein for excavating, backfilling and compacting pipeline trench work shall also apply to such work required for electrical conduit installations.

G. Perform sheeting and shoring in accordance with requirements of Section 31 40 00 - Sheeting, Shoring and/or Bracing. An OSHA approved steel trench box may be considered in lieu of sheeting, shoring, and/or bracing.

H. Perform soil erosion and sediment control work in accordance with details and notes shown on the Drawings and applicable requirements of the Soil Conservation District.

I. If stability of adjoining structures or walls is endangered by excavations, shoring and bracing or underpinning shall be provided as necessary to insure their stability.

J. If it is necessary to place or operate power shovels, trucks or other heavy objects on a level above and near an excavation, the sides of the excavation shall be sheet-piled, shored and braced as necessary to resist the extra pressure due to such superimposed

loads.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. General: No right of property of material is granted the Contractor of excavated materials prior to backfilling. This provision does not relieve the Contractor of his responsibility to remove and dispose of surplus excavation materials.

B. Pipe Bedding:

1. Pipe bedding shall consist of coarse stone aggregate meeting Delaware DOT requirements.

C. Trench Backfill:

1. On site excavated soil or soil-rock mixed materials free of topsoil, plant life, lumber, metal, refuse and rock or similar hard objects larger than two inches in any dimension.
2. Backfill material shall contain sufficient moisture for proper compaction and shall be compacted to not less than 95% of the maximum density for any specific soil classification, as determined by the Modified Proctor Test AASHTO T-180, Method "A".

D. Special Backfill:

1. Material for borrow: See 3.02B3, Section 31 23 00.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. Pipe Lines and Grades: Prior to excavation for any run of piping, set control points for line and grade.

1. Control Point: Sufficiently offset control points from trench centerline to prevent loss of points during excavation and pipe laying operations. Make the offset on the trench side opposite the excavated material stockpile.
2. Set the control points 25 feet apart maximum for lines less than 100 feet in length. Set control points at maximum of 100 feet apart or less if required by the Contractor, for lines greater than 100 feet in length, with a minimum of 4 control points.
  - a. In unpaved or unsurfaced areas, place control points on top of hubs

- driven firmly into the earth. Place a reference stake next to each hub.
- b. In paved areas, drive spikes or cut crosses into paving; in either case, enclose in a painted circle.
  3. Elevations: Taken using a surveyor's level and recorded. Depths of cut to pipeline invert shall be computed and both the stationing and computed depth of cut shall be marked on the stakes and the road surface.
  4. Horizontal and Vertical Control: Use either properly calibrated laser or grade stakes and batter boards to maintain vertical and horizontal alignment. Laser operation personnel shall be competent, trained for use with the instrument.
  5. Methods used to lay out and maintain lines and grades of pipelines, other than those specified previously, will be permitted; however, such methods will be subject to the approval of the Engineer.

### **3.02 PERFORMANCE**

A. Excavating: Perform excavation and backfilling using machinery except that hand excavation and backfilling may be required where necessary to protect existing structures or utilities and except that backfilling shall be done by hand to the extent hereinafter specified. No claim for extra compensation will be allowed for hand excavation instead of machine excavation as may be necessary from any cause whatever.

1. Excavate trenches to necessary width and depth as required elsewhere herein.
2. Begin excavation in trenches at the control point having the lower invert and proceed upgrade.

B. Bedding Placement: Bedding shall be placed uniformly on the prepared base, in a satisfactory manner, to the lines and grades indicated on the Drawings. Placing of bedding by dumping from top of slope or by other methods that will tend to segregate particle sizes within the bedding will not be permitted. Any damage to the surface of the bedding base during placing of the bedding shall be repaired before proceeding with the work.

C. Trench Width and Depth:

1. Trench width shall provide suitable room for proper laying and joining of pipes, considering any sheeting or dewatering requirements. Refer to Drawings for Trench Pay Limits to be utilized for Contingent Bid Items.
2. From subgrade elevation to an elevation at least twelve inches above the top of the outside barrel of the pipe, excavate trench banks to vertical lines.
3. From a point twelve inches above the top of the outside barrel of the pipe, keep trench banks as nearly vertical as possible with due regard for safety.

D. Trench Width and Depth for Electrical Work:

1. Refer to Division 26 - Electrical. Excavate trenches for both single and banked conduit runs to vertical lines and to not less than a minimum nor more than a maximum width required to accommodate the conduit or conduits, with due regard for safety.
2. Excavate trenches for both single and banked conduit runs to elevations indicated, and where not indicated, to the depth required to provide the minimum cover specified in Division 26 - Electrical.

E. Length of Open Trench:

1. No greater length of trench in any location shall be left open in advance of the completed structure placed therein than shall be authorized or directed. The Engineer shall be empowered at any time to require the backfilling of open trenches over completed pipeline if in his judgment such action is necessary, and the Contractor shall thereby have no claim for extra compensation even though to accomplish said backfilling, he is compelled temporarily to stop excavation or other work at any place.
2. If work is stopped on any trench for any reason and the excavation is left open for an unreasonable length of time in advance of construction, the Contractor shall if so directed backfill such trench at his own cost and shall not again open said trench until he is ready to complete the structure therein. If the Contractor shall refuse or fail to backfill such trench completely within 48 hours after said notice, the Owner shall be authorized to do the work; and the Owner shall charge the expense thereof to the Contractor and retain the same out of any monies due or to become due him under the contract.

F. Backfilling:

1. Backfill excavations as rapidly as practicable after completion of construction work therein or after excavations have served their purpose. Unauthorized excavations made by Contractor shall be immediately backfilled at the Contractor's cost. Accomplish backfilling as specified herein and as indicated on drawings.
2. Use material from excavation for backfill unless, in the opinion of the Engineer, such material is not suitable for use as backfill.
3. Unless otherwise indicated or directed, hand place backfill materials in six (6) inch layers to a point at least two (2) feet above pipe crown. Thoroughly compact each layer for the full trench width and under, around and over pipe, using mechanical tampers exerting a pressure of not less than 250 foot pounds per square foot of tamping face.
4. Remainder of trench, more than two feet above pipe crown, may be backfilled by machinery in eight (8) inch layers. Thoroughly compact each layer for the full trench width using mechanical tampers.
5. Upon completion of backfilling in any area under the Contract, the Engineer may require tests to determine the degree of compaction of the backfill material. If the results of tests indicate densities less than specified, the

Contractor shall, at his own expense, remedy the condition as directed, in such portions of the trenches as may be required.

6. No puddling of backfill shall be allowed.
7. Do not use frozen backfill materials or place backfill materials on frozen subgrade or trench surfaces.

G. Backfilling Trenches for Electrical Work:

1. Backfill single and banked conduits, using "Trench Backfill" placed in eight (8) inch minimum compacted layers.

H. Cleanup: After trenches and other excavations are refilled and the work completed, remove surplus excavated materials, stone or such other materials from the work in such manner as the Contractor may elect or provide, but subject to the Engineer's approval. Dispose of such materials off the site in a legal manner at no additional expense to the Owner.

1. If the Contractor fails or neglects to do so or to make satisfactory progress in doing so, within twenty-four hours after the receipt of a written notice from the Engineer, the Owner may remove such surplus material and the expense for such work charged to the Contractor and deducted from any monies due or to become due him under the Contract.

**END OF SECTION**

# **DIVISION 31 - EARTHWORK**

## **SECTION 31 23 19**

### **DEWATERING**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

A. Keeping excavations and structures free from water while the construction work is in progress and to such an extent as may be necessary while excavation work is being carried on. Dewatering shall include, but not necessarily be limited to, designing, furnishing, installing, maintaining, operating, and removing temporary dewatering systems as required to lower and control water levels and hydrostatic pressures during construction; and disposing of pumped water in accordance with the Contract Documents.

B. Dewatering is to be employed to lower the water table and intersecting seepage which would otherwise emerge from the trench side-walls or bottom of the trench or excavation, thereby reducing lateral loads on sheeting and bracing, improving the excavating and hauling characteristics of sandy soil, and preventing rupture or heaving of the bottom of an excavation.

##### **1.02 SUBMITTALS**

A. Contractor shall submit, for the Owner's information, drawings and data showing proposed plan for dewatering of work areas. Drawings and data shall include; the planned method of dewatering, the location of water table before and during dewatering, the excavation plan, the location and capacity of such facilities as dewatering wells, well points, sumps, collection and discharge lines, the standby unit proposed, and protective fills and ditches required for control of ground water and surface water.

B. The dewatering plan shall be submitted within five (5) days after receipt of Notice to Proceed. Contractor shall furnish other information as may be required by the Owner for the complete understanding of the dewatering and excavation plan.

C. Submittal for the Owner's information will not relieve the Contractor of the responsibility for the adequacy of the dewatering and excavation plan or for furnishing equipment, labor and materials necessary for dewatering the various parts of the work. If, during the progress of the work, the dewatering system and excavation plans are inadequate, or the Contractor's plan of construction is inoperative; the Contractor shall, at his expense, furnish, install and operate such additional dewatering equipment and make such changes in other features of the plan or operation as may be necessary to perform the work.

### **1.03 PERMITS**

A. If well-pointing is required, the wells must be installed by a licensed well driller, and a permit to construct such wells must first be obtained by the Contractor from the Delaware Department of Environment (DNREC). A copy of said permit shall be provided to the Owner.

## **PART 2 - PRODUCTS**

Not used.

## **PART 3 - EXECUTION**

### **3.01 METHODS**

A. Dewatering shall be accomplished by methods which shall insure that the groundwater will be drawn down to an elevation below the bottom of the bedding. Dewatering can be accomplished by ordinary pumping methods, by the use of under drains, deep well points or other means, subject to acceptance by the Architect. To assure continuous dewatering, duplicate units of the selected system incorporated with emergency power should be employed. Upon removal of dewatering equipment, the Contractor shall backfill, consolidate and pave (in roads) all holes, including restoration of adjacent disturbed areas to pre-existing, or better, conditions. Dewatering shall be accomplished in compliance with erosion and sediment control regulations.

### **3.02 DEWATERING OF WORK AREAS**

A. All permanent improvements shall be constructed in areas free from water. Contractor shall construct and maintain permanent or temporary slopes, dikes, levees, drainage ditches, sumps, and observation wells necessary or the removal of water from work areas. Contractor shall design, furnish, install, maintain, and operate necessary pumping and other dewatering equipment required for dewatering the various work areas and for keeping the foundation and other work areas free from water from any and all sources.

B. Dewatering shall be performed in advance of excavation. The dewatering shall be accomplished in a manner that will prevent loss of fines from the foundation, will maintain stability of excavated slopes and bottoms of excavations, and will permit construction operations to be performed in the dry. Dewatering of excavation shall be performed to the extent required to permit placement of compacted fill materials in the dry and to prevent sloughing of excavation side slopes.

C. It is absolutely essential that all trenches be kept dry during the making of joint connections.

D. Dewatering shall be performed so as not to undermine or structurally endanger existing structures.

E. Should the Contractor's dewatering operations affect any existing private water supply well used exclusively as a primary potable water source, the Contractor shall, at no additional cost to the Owner, take whatever steps are necessary to provide uninterrupted water service, including the installation of temporary water lines or the installation of permanent wells with treatment systems, if required. Bottled water should be provided immediately to residents whose private wells are damaged during construction.

F. The requirements for dewatering pipe trenches include an obligation on the part of the Contractor to secure a dry trench bottom. If the Contractor elects to use gravel bedding to assist in drainage of trench bottom, he may do so to the extent approved by the Architect. No payment will be made for gravel so used. If the Contractor elects to use gravel to aid in dewatering, the trench shall be wrapped in filter fabric to prevent the migration of fines into the gravel bedding and backfill.

G. It shall be the Contractor's responsibility to verify groundwater conditions prior to bidding. The presence or absence of groundwater at the time of construction shall not entitle the Contractor to additional compensation.

### **3.03 DISPOSAL OF DRAINAGE WATER**

A. The disposal of water from the dewatering and control of water operation and surface drainage shall have no detrimental effect to any new or existing facilities, and shall not cause injury to the public health, to public or private property, or to any portion of the work completed or in progress, or cause any impediment to the use of the streets by the public. Excessive local ponding and siltation, or their deposition, will not be tolerated. The method and location of disposal of water shall be subject to the approval of any local, State or Federal governing agency. Submit approvals to Architect for record. In addition, no water shall be drained into work built or under construction without prior consent of the Architect.

**END OF SECTION**

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## **DIVISION 31 – EARTHWORK**

### **SECTION 31 25 00**

#### **EROSION AND SEDIMENT CONTROL**

##### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Requirements for soil erosion and sediment control at project site.
- B. Removal of control structures and restoration of site.

##### **1.02 GENERAL**

A. Provide necessary equipment, labor and supplies for erosion and sediment control throughout project. The work consists of grading of the site, providing sediment traps and settling trenches, perimeter controls, and other necessary measures required for effective control. Excavation work, mechanical compaction of fills, pipe outlets, seeding and mulching, and other work shall be as required by the laws of the State of Delaware and the Sussex Conservation District. The receipt of a proposal by a bona fide bidder shall be interpreted to mean the Contractor has familiarized himself with these Regulations and Rules of procedure and is fully cognizant of exactly what is required.

##### **1.03 EROSION AND SEDIMENT CONTROL PLAN**

- A. No work shall be started until the erosion control schedules and methods of operation have been accepted by the Engineer and Sussex Conservation District.
- B. No changes or revision to the approved sediment control plan shall be made unless approved by Sussex Conservation District.
- C. Regulating authorities reserve the right to amend the approved Erosion and Sediment Control plan as necessary to compensate for field conditions. Such revisions shall be the sole responsibility of the Contractor to perform and shall not entitle the Contractor to any additional compensation.

##### **1.04 PERMITS**

A. The Contractor is responsible for obtaining permits and/or approvals from the local office having jurisdiction in the area for work off site, where such work is necessary because of construction.

B. Onsite permit cost will be paid by the Owner. Offsite permit cost will be paid by the Contractor.

## **1.05 RESTORATION**

A. Upon completion of work, remove sediment control traps, trenches, and other devices and restore grades to conditions existing prior to start of work unless indicated otherwise. Apply topsoil and seed areas affected by work. Restoration shall not take place until approval is given from regulating authority.

## **PART 2 – PRODUCTS**

### **2.01 COMPLIANCE**

A. All products used shall comply with those specified on the approved Erosion and Sediment Control Plans or as amended by the regulating authority.

## **PART 3 – EXECUTION**

### **3.01 COMPLIANCE**

A. Contractor shall follow Sequence of Construction from approved Erosion and Sediment Control Plans or as amended by the regulating authority.

B. All Erosion and Sediment Control devices shall be installed in accordance with the latest edition of the Delaware Erosion and Sediment Control Handbook.

**END OF SECTION**

# **DIVISION 31 - EARTHWORK**

## **SECTION 31 40 00**

### **SHEETING, SHORING, AND/OR BRACING**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

A. Related work specified elsewhere:

1. Section 31 23 19 - Dewatering
2. Section 31 23 16 - Structural Excavation, Backfill and Compaction
3. Section 31 23 18 - Utility Excavation, Backfill and Compaction

##### **1.02 QUALITY ASSURANCE**

A. Requirements of Regulatory Agencies:

1. Shoring materials and installation work shall conform to Federal, State and local laws, rules, regulations, requirements, precautions, orders and decrees.
2. Provide material for all sheet piling, sheeting, bracing and shoring and drive or set in place in accordance with Federal, State and local laws for excavations and construction; and as may be required to protect the workers and the plant personnel, or to maintain the trench widths specified in Section 31 23 18 – UTILITY EXCAVATION, BACKFILL AND COMPACTION regardless of whether the same is or is not considered necessary by the Contractor.

##### **1.03 JOB CONDITIONS**

A. Responsibility for Condition of Excavation: The failure or refusal of the Engineer to suggest the use of bracing or sheeting, or a better quality, grade, or section, or larger sizes of steel or timber, or to suggest sheeting, bracing, struts, or shoring to be left in place, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of excavation or of any of his obligations under the Contract, nor impose any liability on the Engineer or the Owner nor shall any delay whether caused by any action or want of action on the part of the Contractor, or by any act of the Engineer, Owner, or their agents, or employees, resulting in the keeping of any excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from

caving or slipping, nor from any of his obligations under the Contract relating to injury to persons, or property, nor entitle him to any claims for extra compensation.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

A. Wood Materials: Use wood sheeting, sheet piling, bracing and shoring which is in good serviceable condition and timbers of sound condition, free from large or loose knots and of proper dimensions.

B. Steel Materials: Steel sheet piling and bracing of equal strength may be substituted for wood.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

A. Using skilled labor, drive or set sheeting, sheet piling, braces or shores in place and arranged such that they may be withdrawn as the excavations are backfilled, without injury to piping and structures, and without injury to or settlement of adjacent structures and pavements.

B. Remove sheeting, bracing and shores as trenches and other excavations are being backfilled.

1. In withdrawing sheeting and sheet piling, exercise care to insure that all voids or holes left by planks as they are withdrawn are backfilled and thoroughly rammed with thin rammers provided specially for that purpose.
2. Exercise care to carry backfill up evenly on all sides of items installed in excavations.

**END OF SECTION**

## DIVISION 31

### SECTION 31 62 13

#### PRECAST/PRESTRESSED CONCRETE PILES

##### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

A. Precast/prestressed concrete piles (see foundation plan).

##### 1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

###### ACI INTERNATIONAL (ACI)

ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 214R	Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 318/318R	Building Code Requirements for Structural Concrete and Commentary
ACI SP-66	ACI Detailing Manual

###### ASTM INTERNATIONAL (ASTM)

ASTM A 27/A 27M	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A 36/A 36M	Standard Specification for Carbon Structural Steel
ASTM A 615/A 615M	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A 82/A 82M	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement

ASTM C 1218/C 1218M	Standard Specification for Water-Soluble Chloride in Mortar and Concrete
ASTM C 1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C 136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 143/C 143M	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C 150	Standard Specification for Portland Cement
ASTM C 1567	Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM C 172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C 260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 31/C 31M	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 33/C 33M	Standard Specification for Concrete Aggregates
ASTM C 39/C 39M	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 494/C 494M	Standard Specification for Chemical Admixtures for Concrete
ASTM C 618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C 666/C 666M	Resistance of Concrete to Rapid Freezing and Thawing
ASTM C 989/989M	Standard Specification for Slag Cement for Use in Concrete and Mortars

ASTM D 3689 Test Methods for Deep Foundations Under Static Axial Tensile Load

ASTM D 4945 High-Strain Dynamic Testing of Pile

PRECAST/PRESTRESSED CONCRETE INSTITUTE (PCI)

PCI JR-382 Recommended Practice for Design, Manufacture and Installation of Prestressed Concrete Piling

PCI MNL-116 Manual for Quality Control for Plants and Production of Structural Precast Concrete Products

PCI STD-112 Standard Prestressed Concrete Piles Square, Octagonal and Cylinder

**1.03 SUBMITTALS**

- A. Owner approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

**SD-01 Preconstruction Submittals**

1. Installation Procedures
2. Geotechnical Consultant Documentation
3. Wave Equation Analysis
4. Order List
5. Precasting manufacturer's quality control procedures
6. Provide instructions and procedures on how the Contractor will assist the Owner in the processes of Dynamic Pile Testing, Inspection and Monitoring of piles during installation and testing.

**SD-02 Shop Drawings**

7. Piles
8. Product Data
9. Pile Driving Equipment
10. Submit descriptions of pile driving equipment, including hammers, power packs, driving helmets, cap blocks, pile cushions, leads, extractors, jetting equipment, and preboring equipment at least 30 days prior to commencement of work.

**SD-03 Design Data**

11. Concrete mix design
12. Submit a concrete mix design before concrete is placed, for each type of concrete used for the piles.

**SD-04 Test Reports**

13. Aggregates
14. Concrete Compressive Strength
15. Load tests

16. Submit concrete cylinder compressive strength test results. Submit test pile records.
17. Dynamic Pile Analysis
18. Submit a summary report of dynamic test results for test piles within 7 calendar days of completing field work.

**SD-05 Certificates**

19. Aggregates
20. Admixtures
21. Cement

**SD-06 Closeout Submittals**

22. Pile records
23. Submit pile and test pile records.

**1.04 QUALITY ASSURANCE**

**1.04.1 PILES**

- A. Prepare in accordance with ACI SP-66. Indicate placement of reinforcement including tendons. Indicate location of special embedded or attached lifting devices, employment of pick-up points, support points other than pick-up points, and any other methods of pick-up. Provide certification of a Professional Engineer registered in the state the project is located in stating piles have been designed to meet the 2021 IBC and are capable of the capacity indicated in the drawings.

**1.04.2 QUALITY CONTROL PROCEDURES**

- A. Submit the precasting manufacturer's quality control procedures and inspection records established in accordance with PCI MNL-116.

**1.04.3 INSTALLATION PROCEDURES**

- A. Submit information on the type of equipment proposed to be used, proposed methods of operation, pile driving plan including proposed sequence of driving, and details of all pile driving equipment and accessories.
- B. Provide details of pile driving equipment and a Wave Equation Analysis of pile drivability for selection of the hammer along with a statement of driving procedures. The Wave Equation Analysis is to be completed by the Contractor's Geotechnical Consultant for each test pile location where different subsurface conditions exist and is to include the following information pertaining to the proposed pile driving equipment:
  1. Complete Pile and Driving Equipment Data Form, located at the end of this section, for each proposed pile hammer and pile type combination.
  2. Copies of computer input and output sheets and graphs showing soil resistance versus blow count as well as maximum tension and compression stresses versus blow count. Analysis shall be run at the estimated tip elevation as well as other required elevations to define maximum stress levels in the pile during driving.
- C. Provide detailed procedures for conducting the dynamic pile load test and equipment to be used for conducting the load test. The detailed description shall explain how specific

information of pile performance will be evaluated.

#### **1.04.4 GEOTECHNICAL CONSULTANT DOCUMENTATION**

- A. The services of an independent, Registered Professional Geotechnical Engineer, experienced in soil mechanics and Pile Dynamic Analysis, shall be hired by the Contractor to observe test pile installation and job pile installation as specified herein. The Geotechnical Consultant shall be independent of the Contractor and shall have no employee of employer relationship which could constitute a conflict of interest.

#### **1.04.5 CONCRETE MIX DESIGN**

- A. Certify, using a independent commercial testing laboratory, that proportioning of mix is in accordance with ACI 211.1 or ACI 318/318R for specified strength and is based on aggregate data which has been determined by laboratory tests during last twelve months. Submit a complete list of materials including type; brand; source and amount of cement, fly ash, pozzolan, ground slag, and admixtures; and applicable reference specifications. Submit additional data regarding concrete aggregates if the source of aggregate changes. Submittal shall clearly indicate where each mix design will be used when more than one mix design is submitted.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Piles shall be stored, handled, and transported in accordance with PCI MNL-116 except as follows. Methods used for handling and storage of piles shall be such that the piles are not subjected to excessive bending stress, cracking, spalling, or other damage.

##### **1.05.1 DAMAGED PILES**

- A. The Contractor shall inspect each pile for sweep and structural damage such as cracking and spalling before transporting them to the project site and immediately prior to placement in the driving leads. Any unusual cracks (cracks other than crazing, surface drying, shrinkage cracks and end cracks) shall be brought to the attention of the Engineer. Piles which are damaged during delivery, storage, or handling to the extent they are rendered unsuitable for the work, in the opinion of the Engineer, shall be rejected and removed from the project site, or may be repaired, if approved, at no cost to the Owner.

##### **1.05.1.1 REPAIRABLE CRACKS**

- A. Piles with cracks equal to or greater than 0.006 inches but less than 0.06 inches shall be rejected or repaired. As an alternate to pile rejection, the Contractor may submit a proposal to repair deficient piles, which shall be restored prior to driving to provide its required design capacity, perform its intended function in the structure, and take into consideration long term durability in corrosive environment.

##### **1.05.1.2 NON-REPAIRABLE CRACKS**

- A. Piles with cracks equal to or greater than 0.06 inches shall be rejected.

### **1.05.2 PILE SWEEP**

- A. Sweep shall be limited to 1/8 inch per 10 feet over the length of the pile. Piles having excessive sweep shall be rejected.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

#### **2.01.1 CEMENTITIOUS MATERIALS**

- A. Cementitious materials shall be portland cement that conforms to appropriate specifications listed below.

##### **2.01.1.1 CEMENT**

- A. ASTM C 150, Type II with a maximum alkali content of 0.40. If no satisfactory test results are available (made within the past six months) to prove that the cement alkali content is less than 0.40 percent, then cement with a maximum of 0.60 percent alkali shall be used. Cement certificates shall include test results in accordance with ASTM C 150, including equivalent alkalis indicated in the optional chemical requirements. Use cement with a tricalcium aluminate (C3A) content of less than 8 percent.

##### **2.01.2 WATER**

- A. Water shall be fresh, clean, and potable; free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete or steel.

##### **2.01.3 AGGREGATES**

- A. ASTM C 33/C 33M, except as modified herein. Provide aggregate free from any substance which may be deleteriously reactive with alkalis in cement in an amount sufficient to cause excessive expansion of concrete. Do not mix, store in same stockpile, or use fine aggregates from different sources of supply in same concrete mix or same structure without approval. The fineness modulus of fine aggregate shall be not less than 2.40 or greater than 3.0. For piles that will be exposed to freezing and thawing, fine and coarse aggregate subjected to five cycles of the sodium sulfate soundness test shall show a loss not greater than 10 percent. If the selected aggregates fail the soundness test, the Contractor may use the aggregate source, provided concrete specimens made with the aggregates to be used for the piles shall have a durability factor of not less than 80 based on 300 cycles of freezing and thawing when tested in accordance with ASTM C 666/C 666M. Prior to pile fabrication, submit certified test reports for the following tests specified in ASTM C 33/C 33M:

1. Grading
2. Amount of material finer than No. 200 sieve
3. Organic impurities
4. Soundness
5. Clay Lumps and friable particles
6. Coal and lignite
7. Weight of slag
8. Abrasion of coarse aggregate
9. Fineness modulus
10. Reactive aggregates
11. Freezing and thawing

#### **2.01.3.1 ALKALI-SILICA REACTIVITY (ASR)**

- A. Fine and coarse aggregates to be used in all concrete shall be evaluated and tested by the Contractor for alkali-aggregate activity. The fine and coarse aggregates shall be evaluated separately, using ASTM C 1260. Test results of the individual aggregates shall have a measured expansion equal to or less than 0.08 percent at 16 days after casting. Should the test data indicate an expansion of greater than 0.08 percent, the aggregate(s) shall be rejected or additional testing, using ASTM C 1567, shall be performed as follows: utilize the Contractor's proposed low alkali portland cement and SCM in combination with the proposed aggregate for the test portioning. The SCM quantity shall be determined that will meet all the requirements of these specifications and that will lower the ASTM C 1567 expansion to equal or less than 0.08 percent at 16 days after casting. If the above option does not lower the expansion to less than 0.08 percent at 16 days after casting, reject the aggregate(s) and submit new aggregate sources for retesting. Submit the results of testing to the Contracting Officer for evaluation and acceptance.

#### **2.01.4 ADMIXTURES**

- A. Chemical admixtures shall conform to ASTM C 494/C 494M. Air-entraining admixture shall conform to ASTM C 260. Do not use admixtures containing chlorides.

#### **2.01.5 REINFORCING STEEL**

- A. ASTM A 615/A 615M, Grade 60.

#### **2.01.6 PRESTRESSING STEEL**

- A. Use seven-wire stress-relieved or low-relaxation strand conforming to ASTM A416/A416M, Grade 270. Use prestressing steel free of grease, oil, wax, paint, soil, dirt, and loose rust. Do not use prestressing strands or wire having kinks, bends, or other defects.

#### **2.01.7 TIES AND SPIRALS**

- A. Steel, ASTM A 82/A 82M for spirals and ASTM A 615/A 615M for ties.

## **2.01.8 ANCHORAGES AND END FITTINGS**

- A. ACI 318/318R.

## **2.01.9 GROUT**

- A. Provide cement grout for prestressed piles using materials conforming to requirements stipulated herein for concrete mixes. Use admixtures, if required, known to have no injurious effects on steel or concrete. Do not use calcium chloride.

## **2.01.10 PILE DRIVING POINTS**

- A. Pile driving points shall be of steel conforming to the requirements of ASTM A 27/A 27M or ASTM A 36/A 36M.

## **2.02 CONCRETE MIX DESIGN**

- A. ACI 211.1 or ACI 318/318R, Chapter 4. Concrete shall have a minimum compressive strength of 6000 psi at 28 days and a maximum size aggregate of 1-1/2 inches. Concrete shall be air entrained with a minimum of 4.5 percent and a maximum of 7.5 percent. Mix shall contain fly ash, ground iron blast furnace slag or silica fume to meet the requirements specified herein to mitigate Alkali-Silica Reactivity (ASR). Ensure, a dense concrete free of shrinkage cracks, with a minimum degree of permeability. The maximum water cement ratio shall be 0.40.

## **2.03 FABRICATION**

### **2.03.1 FORMWORK**

- A. Formwork and dimensional tolerances shall be in accordance with PCI MNL-116, and as specified herein. Provide forms of metal, braced and stiffened against deformation, accurately constructed, watertight, and supported on unyielding casting beds. Forms shall permit movement of pile without damage during release of prestressing force. Form precast dowel holes with galvanized flexible metal conduit.

### **2.03.2 PRETENSIONING**

- A. Pretensioning shall be performed in accordance with PCI MNL-116, and as specified herein. Use gage calibrated within last 6 months by an approved laboratory. Provide means for measuring elongation of steel to nearest 1/8 inch. Give tensioning steel a uniform prestress prior to being brought to design prestress. Induce same initial prestress in each unit when several units of prestressing steel in a pile are stretched simultaneously.

### **2.03.3 CASTING**

#### **2.03.3.1 CONVEYING**

- A. Convey concrete to formwork in accordance with PCI MNL-116, and as specified herein. Clean conveying equipment thoroughly before each run. During placing, make any free vertical drop of the concrete less than 3 feet. Remove concrete which has segregated in conveying or placing.

### **2.03.3.2 PLACING AND CASTING**

- A. Do not deposit concrete in forms until placement of reinforcement and anchorages has been inspected and approved by pile manufacturer's quality control representative. Produce each pile of dense concrete straight with smooth surfaces with reinforcement retained in its proper position during fabrication. Use vibrator with heads smaller than the minimum distance between steel for pretensioning. Make surface of pile ends perpendicular to axis of pile. Chamfer, 3/4 inch, ends of piles and corners of square piles.

### **2.03.4 CURING OF PILES**

- A. Curing of piles shall be in accordance with the PCI MNL-116 except as follows.

#### **2.03.4.1 MOIST CURING**

- A. Moist cure using moist burlap coverings, plastic sheeting, or membrane curing compound until minimum strength to detension is achieved.

#### **2.03.4.2 ACCELERATED CURING**

- A. After placement of concrete, moist cure for a period of 4 hours. Follow by accelerated curing until concrete has reached specified release strength. Enclose casting bed for accelerated curing with a suitable enclosure. During application of steam or heat, increase the air temperature at a rate not to exceed 40 degrees F per hour. Cure at a maximum temperature of 150 degrees F until concrete has reached specified release strength. Reduce temperature at a rate not to exceed 20 degrees F per hour until a temperature of 20 degrees F above ambient air temperature is reached. After accelerated curing, moist cure using either water or membrane curing until a total accelerated and moist curing time of 72 hours is achieved.

### **2.03.5 DETENSIONING**

- A. Detensioning shall be performed in accordance with PCI MNL-116, and as specified herein. Gradually release tension in strands from anchorage. Detension after approval by pile manufacturer's quality control representative. Perform transfer of prestressing force when concrete has reached a minimum compressive strength of 0.8 times the 28 day strength.

### **2.04 PRODUCT QUALITY CONTROL**

- A. Where piling is manufactured in a plant with an established quality control program as attested to by a current certification in the PCI "Certification Program for Quality Control"

perform product quality control in accordance with PCI MNL-116. Where piling is manufactured by specialists or in plants not currently enrolled in the PCI "Certification Program for Quality Control," set-up a product quality control system in accordance with PCI MNL-116 and perform concrete and aggregate quality control testing using an approved independent commercial testing laboratory.

#### **2.04.1 AGGREGATE TESTS**

- A. Take samples of fine and coarse aggregate at concrete batch plant and test. Perform mechanical analysis (one test for each aggregate size) in accordance with ASTM C 136. Tabulate results of tests in accordance with ASTM C 33/C 33M.

#### **2.04.2 SLUMP AND STRENGTH TESTS**

- A. Sample concrete in accordance with ASTM C 172 at time concrete is deposited for each production line. Perform slump tests in accordance with ASTM C 143/C 143M. Mold cylinders in accordance with ASTM C 31/C 31M. Mold at least six cylinders per day or one for every 20 cubic yards of concrete placed, whichever is greater. Cure cylinders in same manner as piles and for accelerated curing, place at coolest point in casting bed. Perform strength tests in accordance with ASTM C 39/C 39M. Test two cylinders of each set at 7 days or 14 days. Test remaining cylinders of each set 28 days after molding.

#### **2.04.3 CHANGES IN PROPORTIONS**

- A. If, after evaluation of strength test results, compressive strength is less than specified compressive strength, make adjustments in proportions and water content and changes in temperature, moisture, and curing procedures as necessary to secure specified strength. Submit changes in mix design to the Engineer in writing.

#### **2.04.4 COMPRESSIVE STRENGTH TEST RESULTS**

- A. Evaluate compressive strength test results at 28 days in accordance with ACI 214R using a coefficient of variation of 10 percent. Evaluate strength of concrete by averaging test results of each set of standard cylinders tested at 28 days. Not more than 10 percent of individual cylinders tested shall have a compressive strength less than specified design strength.

#### **2.04.5 CHLORIDE ION CONCENTRATION**

- A. Sampling and determination of water soluble chloride ion content in accordance with ASTM C 1218/C 1218M. Maximum water soluble chloride ion concentrations in hardened concrete at ages from 28 to 42 days contributed from the ingredients including water, aggregates, cementitious materials, and admixtures shall not exceed 0.06 percent by weight of cement.

#### **2.04.6 CHLORIDE ION PENETRATION**

- A. Concrete shall be proportioned to have the chloride ion penetration test in accordance

with ASTM C1202, and be below 3000 coulombs for concrete specimens tested at 56 days.

## **PART 3 - EXECUTION**

### **3.01 PILE DRIVING EQUIPMENT**

#### **3.01.1 PILE HAMMERS**

- A. Furnish a hammer capable of developing the indicated ultimate pile capacity considering hammer impact velocity; ram weight; stiffness of hammer and pile cushions; cross section, length, and total weight of pile; and character of subsurface material to be encountered. Use the same pile hammer, operating at the same rate and in the same manner, as that used for driving test piles. Obtain required driving energy of hammer, except for diesel hammers, by use of a heavy ram and a short stroke with low impact velocity. At final driving, operate pile hammer in accordance with manufacturer's recommendation for driving either end bearing piles or friction piles. At final driving, operate diesel powered hammers at rate recommended by manufacturer for hard driving. Maintain pressure at steam or air hammer so that: (1) for double-acting hammer, the number of blows per minute during and at completion of driving of a pile is equal approximately to that at which hammer is rated; (2) for single-acting hammer, there is a full upward stroke of the ram; and (3) for differential type hammer, there is a slight rise of hammer base during each upward stroke.

#### **3.01.2 DRIVING HELMETS AND CUSHION BLOCKS**

##### **3.01.2.1 DRIVING HELMETS OR CAPS AND PILE CUSHIONS**

- A. Use a steel driving helmet or cap including a pile cushion between top of pile and driving helmet or cap to prevent impact damage to pile. Use a driving helmet or cap and pile cushion combination capable of protecting pile head, minimizing energy absorption and dissipation, and transmitting hammer energy uniformly over top of pile. Provide driving helmet or cap that fits sufficiently loose around top of pile so that pile may be free to rotate without binding within driving helmet. Use pile cushion of solid wood or of laminated construction using plywood, softwood or hardwood boards with grain parallel to end of pile. Provide pile cushion with thickness of 3 inches minimum and the thickness shall be increased so as to be suitable for the size and length of pile, character of the sub-surface material to be encountered, hammer characteristics, and the required driving resistance. Replace pile cushion at the start of driving of each pile and when it becomes highly compressed, charred or burned, or has become spongy or deteriorated in any manner. Show details of driving helmets, capblocks, and pile cushions. Submit 2 weeks prior to test pile installation.

##### **3.01.2.2 HAMMER CUSHION OR CAPBLOCK**

- A. Use a hammer cushion or capblock between driving helmet or cap and hammer ram consisting of a solid hardwood block with grain parallel to the pile axis and enclosed in a close-fitting steel housing. Use steel plates at top and bottom of capblock. Replace wood capblock when it becomes highly compressed, charred or burned or becomes

spongy or deteriorated in any manner. Do not replace wood capblock during final driving of any pile. Do not use small wood blocks, wood chips, rope or other materials that permit excessive loss of hammer energy.

### **3.02 PRELIMINARY WORK**

#### **3.02.1 WAVE EQUATION ANALYSIS OF PILE DRIVABILITY**

- A. Prior to driving any pile, the Contractor shall submit a pile Wave Equation Analysis, performed by his Geotechnical Consultant, for each size pile and distinct subsurface profile condition. These analyses shall take into account the proposed hammer assembly, pile cap block and cushion characteristics, the pile properties and estimated lengths and the soil properties anticipated to be encountered throughout the installed pile length based on static capacity analysis with consideration of driving gain/loss factors. Only one specific model of pile hammer may be used for each pile type and capacity.
- B. The Wave Equation Analysis shall demonstrate that the piles will not be damaged during driving, shall indicate that the driving stresses will be maintained within the limits below and indicate the blow count necessary to achieve the required ultimate static pile capacities.

#### **Allowable Driving Stresses**

##### Concrete

- Compression - 0.85f'c minus UPL
- Tension - (3 times (the square root of f'c))

f'c is compressive strength of concrete  
(Obtain values from pile manufacturer)

- C. Upon completion of the dynamic and static testing programs outlined in this specification section, a refined Wave Equation Analysis shall be performed taking into consideration the evaluated capacities, gain/loss factors and recommended production pile lengths. Production pile driving criteria shall be developed based on the results of the refined Wave Equation Evaluations.
- D. All pile driving equipment furnished by the Contractor shall be subject to the approval of the Contractor's Geotechnical Consultant. Complete the attached pile and driving equipment data form, including hammer information, in full as part of the submittal of the results of the Wave Equation Analyses.
- E. The cost of performing the Wave Equation Analyses shall be paid for by the Contractor and included in the base bid.

#### **3.02.2 ORDER LIST**

- A. The Contractor shall submit to the Engineer for approval, an itemized list for piles prior

to placing the order with the supplier. The list shall indicate the pile lengths required at each location as shown on the plans and the corresponding ordered length of each pile. Load testing and refined wave equation analysis shall be completed prior to submission of an order list.

### **3.02.3 PILE LENGTH MARKINGS**

- A. The Contractor shall mark each pile prior to driving with horizontal lines at one foot intervals, and the number of feet from pile tip at 5 foot intervals.

## **3.03 PILE DRIVING**

### **3.03.1 DRIVING PILES**

- A. Notify Engineer 10 days prior to driving of test piles. Piles may be driven when the specified 28-day concrete strength has been achieved but not less than 7 days after casting. Drive piles to or below "calculated" tip elevation to reach a driving resistance established by the wave equation analyses (WEAP) in accordance with the schedule which the Contractor's Geotechnical Consultant will prepare from the test-pile driving data. During initial driving and until pile tip has penetrated beyond layers of very soft soil use a reduced driving energy of the hammer as required to prevent pile damage. Refusal criteria shall be established by the Engineer. If a pile fails to reach "calculated" tip elevation, or if a pile reaches "calculated" tip elevation without reaching required driving resistance, notify Engineer and perform corrective measures as directed. Provide hearing protection when noise levels exceed 140 dB. Piles or pile sections shall not be handled or moved in any manner that would result in cracking or permanent damage to the concrete. Piles may be driven without pile guides or leads providing a hammer guide frame is used to keep the pile and hammer in alignment.

### **3.03.2 PROTECTION OF PILES**

- A. Take care to avoid damage to piles during handling, placing pile in leads, and during pile driving operations. Support piles laterally during driving, but allow rotation in leads. Where pile or projecting reinforcement orientation is essential, take precautionary measures to maintain the orientation during driving. Square top of pile to longitudinal axis of pile. Maintain axial alignment of pile hammer with that of the pile. If the Contractor elects to use a pile head with projecting strands or mild steel reinforcement, prevent direct impact forces from being transmitted through the reinforcement, by using a special driving head.

### **3.03.3 TOLERANCES IN DRIVING**

- A. Drive piles with a variation of not more than 2 percent from vertical for plumb piles or more than 4 percent from required angle for batter piles. Maintain and check axial alignment of pile and leads at all times. If subsurface conditions cause pile drifting beyond allowable axial alignment tolerance, notify Engineer and perform corrective measures as directed. Place butts within 4 inches of location indicated. Manipulation of piles within specified tolerances will not be permitted. In addition to specified tolerances, maintain a location to provide a clear distance of at least 5 inches from butt

to edge of pile cap. If clear distance can not be maintained, then notify Engineer. Check each pile for heave. Redrive heaved piles to required point elevation.

#### **3.03.4 REJECTED PILES**

- A. Piles damaged or impaired for use during handling or driving, mislocated, or driven out of alignment beyond the maximum tolerance shall be withdrawn and replaced by new piles or shall be cut-off and abandoned and new piles driven as directed. Excess cut-off from piles and unacceptable piles shall be removed from the work site. All work in connection with withdrawing and removing rejected piles from the site shall be done at no additional cost to the Owner.

#### **3.03.5 JETTING OF PILES**

- A. Water jets will not be permitted.

#### **3.03.6 PREDRILLING OF PILES**

- A. Predrilling to remove soil or other material representing the bulk of the volume of the pile to be driven will not be permitted.

#### **3.03.7 SPLICES**

- A. Splice as indicated. Splices shall be capable of developing the full strength of the member in compression, tension, shear, and bending. Detail drawings of splices and design calculations demonstrating the strength of the splice shall be submitted for approval and be signed and sealed by a registered Professional Engineer licensed in the state where this project resides.

#### **3.03.8 BUILD-UPS**

- A. Where required, pile section may be extended to cut-off elevation by means of a cast-in-place reinforced concrete build-up. Make build-up in accordance with PCI STD-112. Construct build-ups made after completion of driving in accordance with detail, "Build-Up Without Driving." Make build-ups to be driven in accordance with detail "Build-Up With Driving." Have details of means for protecting joints by a suitable mortar or epoxy approved by Engineer. Where build-ups are exposed to water, protect cast-in-place section from water during curing period. Concrete in build-up shall have a minimum compressive strength of 6000 psi. Build-ups will not be permitted on more than 10 percent of total number of piles. If this percent figure is exceeded, or if in the judgment of the Contracting Officer, the clustered location of build-ups is undesirable, withdraw piles of insufficient length and replace with longer piles. Payment for such withdrawal and replacement will be made as an adjustment to the contract price.

#### **3.03.9 PILE CUT-OFF**

- A. Cut-off piles with a smooth level cut using pneumatic tools, sawing, or other suitable methods approved by Engineer. Use of explosives for cutting is not permitted. Cut-off

sections of piles shall be removed from the site upon completion of the work.

### **3.04 FIELD QUALITY CONTROL**

#### **3.04.1 TEST PILES**

- A. Use test piles of type and drive as specified for piling elsewhere in this section. The Contractor's Geotechnical Consultant will use test pile data to determine "calculated" pile tip elevation or necessary driving resistance. Drive test piles at the locations indicated. Drive test piles to indicated tip elevation. Use test piles, if located properly and offering adequate driving resistance in finished work. A pile dynamic analyzer shall be provided and operated as specified in paragraph DYNAMIC PILE ANALYSIS during the driving of each test pile. Modify driving as required based upon recommendation of Contractor's Geotechnical Consultant and approval of the Engineer.

#### **3.04.2 DYNAMIC PILE ANALYSIS**

- A. The purpose of dynamic testing is to provide supplemental information for evaluating pile hammer performance, driving stresses, and bearing capacities. Dynamic testing shall be conducted during the entire time piles are initially driven or redriven and during pile restrike testing. Use test piles of type as specified elsewhere in this section. Equipment to obtain dynamic measurements, record, reduce and display its data shall be furnished and meet the requirement of ASTM D 4945. The equipment shall have been calibrated within 12 months thereafter throughout the contract duration. Drive test piles at the locations indicated. The contractor shall employ an independent inspection firm, hereinafter referred to as the "Contractor's Geotechnical Consultant", experienced in the pile driving process, monitoring of test pile installation, and in the use of the Pile Driving Analyzer and its related equipment. Dynamic pile analysis shall be performed as follows:
- B. Each dynamic pile analysis shall be performed in two steps. The first step is to check the hammer, pile and soil performance, and to determine the suitability of the proposed hammer for the size, length and type of pile being installed for the soil types encountered as the piles are driven. This initial monitoring shall determine efficiency of the hammer relative to specified efficiency, effectiveness of cushion, level of compressive and tensile stress in pile and extent/location of any pile damage caused by the initial driving. With each blow of the pile the information listed below shall be electronically recorded and analyzed by the Pile Driving Analyzer:
1. Blow number
  2. Blow rate per minute and/or stroke.
  3. Input and reflected values of force and velocity.
  4. Value of upward and downward traveling force wave with time.
  5. Maximum and final transferred energy to pile, hammer system efficiency.
  6. Maximum compressive stress, velocity, acceleration and displacement.
  7. Maximum tensile stress in pile.

8. Pile structural integrity, damage detection, extent and location.
  9. Bearing capacity of pile by Case method.
- C. If the pile, hammer and soil performance evaluation recommends changes to the hammer stroke, pile cushioning, augering or any other aspect for the pile driving operation these changes shall be incorporated into production pile driving in an effort to control excessive stresses and pile damage. Test piles damaged or broken during installation shall be replaced, incorporating driving modifications as determined by the Contractor's Geotechnical Consultant and reviewed and approved by the Engineer. This procedure shall be repeated until allowable tensile and compressive stresses are achieved in the pile and/or pile damage is minimized. Selected initial driving records shall be subjected to rigorous computer analysis by the Case Pile Wave Analysis Program (CAPWAP) for determination of resistance distribution, soil resistance and properties, and estimation of anticipated gain/loss factors.
- D. Upon completion of test pile driving the piles shall be allowed to set-up for at least 72 hours. After evaluation of pile, hammer and soil performance by the Contractor's Geotechnical Consultant, the second step of the dynamic pile analysis may proceed. This portion of the evaluation requires striking the set-up piles a minimum of 20-50 times, or as directed by the Contractor's Geotechnical Consultant using the same hammer which was used for the test pile driving and which will be used for production pile driving. The hammer shall be "warmed up" and in optimal readiness prior to restriking, in order to avoid capacity losses during evaluation of restrrike data. Maximum hammer energy shall be applied during restrrike in order to fully mobilize the soil resistance. However, care should be exercised as to not overstress the pile. In addition to those items listed above, selected restrrike driving records (as directed by the Contractor's Geotechnical Consultant are to be subjected to rigorous computer analysis by the Case Pile Wave Analysis Program (CAPWAP) for determination of resistance distribution, soil resistance and properties, and plot of applied load vs. average pile displacement based on the calculated soil properties.
- E. Performance Report:
1. Upon satisfactory completion of each dynamic load test a minimum of three copies of a Pile Performance Report shall be submitted for the Contractor by the Contractor's Geotechnical Consultant. The submittal shall be prepared and sealed by a Professional Engineer registered in the state where the project is located and shall be made within three working days of the completion of the dynamic load test.
  2. The report for the Dynamic Pile Analysis shall contain the following information:
    - a. Bearing capacity of pile from Case Pile Wave Analysis Program (CAPWAP). Information resulting from analysis of a selected restrrike blow.
    - b. Maximum and final transferred energy, hammer system efficiency during pile installation.

- c. Maximum compressive stress, velocity, acceleration and displacement.
  - d. Maximum tensile stress in pile.
  - e. Pile structural integrity, damage detection, extent and location.
  - f. Blows per minute and blow number.
  - g. Input and reflection values of force and velocity, upward and downward traveling force wave with time.
  - h. Pile skin friction and toe resistance distribution. (i) Maximum energy transferred to pile.
- D. The equipment to be used for dynamic testing of the pile hammer and soil performance and for dynamic load testing of the test pile shall be either a model GCPC or a PAK Pile Driving Analyzer as manufactured by Pile Dynamics, Inc., of Cleveland Ohio or approved equivalent.
- E. All services of the Contractor's Geotechnical Consultant shall be paid for by the Contractor. The Contractor's Geotechnical Consultant shall be available throughout the pile driving operation to consult with the Engineer when required by the Engineer. The cost of changes in the Contractor's procedure, as required by evaluation of the results of the Pile Driving Analysis, shall be at the Contractor's expense.

### **3.04.3 PILE RECORDS**

- A. A third party testing company shall keep a complete and accurate record of each pile driven. Indicate the pile location, deviations from pile location, cross section shape and dimensions, original length, ground elevation, tip elevation, cut-off elevations, number of blows required for each foot of penetration and number of blows for the last 6 inches penetration or fraction thereof as required for the "calculated" driving resistance. Include in the record the beginning and ending times of each operation during driving of pile, type and size of hammer used, rate of operation, stroke or equivalent stroke for diesel hammer, type of driving helmet, and type and dimension of hammer cushion (capblock) and pile cushion used. Record retap data and unusual occurrences during piling driving such as re-driving, heaving, weaving, obstructions, jetting, and any driving interruptions.

**END OF SECTION**



## **DIVISION 02 - SITE WORK**

### **SECTION 32 12 16**

#### **HOT MIX ASPHALT PAVING**

##### **PART 1 - GENERAL**

###### **1.01 DESCRIPTION**

A. The Contractor shall furnish all labor, materials and equipment necessary to perform all paving and surfacing where shown on the Contract Drawings. The type of material, thickness and typical sections shall be as shown on the Contract Drawings.

B. Related Work Specified Elsewhere:

1. Section 31 22 13: SITE PREPARATION AND ROUGH GRADING.

###### **1.02 QUALITY ASSURANCE**

A. Source Quality Control: Maintain quality in products by using those of a qualified bituminous concrete producer having qualified plant operating personnel.

B. Experience: The bituminous concrete producer shall be a bulk producer regularly engaged in production of hot-mixed, hot-laid bituminous concrete conforming to the standards referenced herein.

C. Workmen Qualifications: Provide at least one person thoroughly trained and experienced in the skills required who readily understands the design and is completely familiar with the application of stone base and bituminous concrete paving work. Said person shall be present at all times during progress of the stone base and bituminous concrete paving work and shall direct the performance of said work. For actual finishing of bituminous concrete surfaces and operation of the equipment, use only personnel thoroughly trained and experienced in the skills required.

D. Reference Standards: Delaware Department of Transportation (DelDOT) Standard Specifications, current edition.

###### **1.03 JOB CONDITIONS**

A. Weather Limitations: Apply tack coats only when ambient temperature is above 50°F., and when temperature has not been below 35°F. for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

B. Construct asphaltic concrete surface course only when atmospheric temperature is above 40°F., and when base is dry. Surface course may be placed when air temperature is above 40°F. and rising.

C. Grade Control: Establish and maintain required lines and elevations.

#### **1.04 SUBMITTALS**

A. Mix designs for hot mix asphalt shall be submitted in writing by the Contractor sufficiently in advance of paving operations to allow three weeks for review and approval. The design information shall include the following:

1. The use of which the material is proposed.
2. The designation, source and anticipation gradation of each of the component aggregates.
3. The estimated percentage of each aggregate required to yield the desired blend.
4. The resulting percentage passing each sieve size stipulated by the appropriate band.
5. The source of the asphalt material to be used.

B. Delivery Tickets: Submit in triplicate for each load placed on the project.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS - GENERAL**

A. General: Use locally available materials and gradations which exhibit a satisfactory record at previous installations.

B. Sub-Base Course Aggregate, Binder Course Aggregate and Surface Course Aggregates: Crushed stone, crushed slag or crushed gravel and siliceous sand as specified in DeIDOT Section 300. Specifications as amended. Replacement materials same as existing pavement.

C. Asphalt Cement: Comply with, AASHTO M226, Grade AC-20.

D. Bituminous Tack Coat: Comply with DeIDOT, Section 1011.

E. Hot Mix Asphalt Paving: Construct Base Course and Surface Course to the cross section shown on the plans and in strict accordance with DeIDOT Section 401.

## **2.02 PAVEMENT MIXES**

A. Composition of Mixtures: Binder and wearing course mixture composition shall conform to the requirements of the above referenced specifications and the following:

1. Establish a job-mix formula prior to beginning work which shall not be changed during the progress of work without the Engineer's approval. Job-mixing tolerances shall not be presumed to permit acceptance of materials whose gradations fall outside the master ranges set forth in the above referenced specifications.
2. The approved job-mix formula shall lie within the specification limits and be suitable for the layer thickness and other conditions prevailing. It shall not be changed after work has started without the approval of the Engineer.

B. Aggregate Quality: Aggregate shall meet the requirements of the Standard Specifications for "Crushed Stone, Crushed Slag, and Crushed Gravel for Dry- or Water-Bound Macadam Base and Surface Courses of Pavements," ASTM D 693-77 with the exception that gradation shall be as described above and a soundness test is required.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

A. The Contractor shall not install permanent hot mix asphalt pavement until the entire project is substantially complete. The Contractor shall install and maintain aggregate subbase during the construction of the project, and shall make all repairs to subbase as required by the Engineer.

### **3.02 INSPECTION**

A. Examine areas and conditions under which asphalt concrete paving is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

### **3.03 PAVEMENT BASE COURSE**

A. Grade Control: During construction, maintain lines and grades including cross-slope of base course.

B. Placing: Place sub-base course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting sub-base material during placement operations.

### **3.04 SURFACE PREPARATION**

- A. Remove loose material from compacted sub-base surface before applying binder course.
- B. Proof roll or tamp prepared sub-base to check for unstable areas and areas requiring additional compaction.

### **3.05 PLACING MIX**

- A. General: Place hot mix asphalt over base course as specified in DeIDOT Specifications, Section 300.

### **3.06 FIELD QUALITY CONTROL**

- A. General: Test in-place asphaltic concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed.
- B. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
  - 1. Binder Course: 1/2", plus or minus.
  - 2. Surface Course: 1/4", plus or minus.
- C. Surface Smoothness: Test finished surface of each asphaltic concrete course for smoothness, using 10' straightedge. Surfaces will not be acceptable if exceeding following tolerances for smoothness:
  - 1. Base Course Surfaces: 1/4".
  - 2. Wearing Course Surface: 3/16".

### **3.07 PROTECTION**

- A. Protect from damage and vehicular traffic until paving has cooled and attained its maximum degree of hardness.

**END OF SECTION**

## **DIVISION 2 – SITEWORK**

### **SECTION 32 16 00**

#### **SIDEWALKS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Concrete walks with sub-grade preparation, forms, reinforcing, finishing, and curing.

###### **1.02 JOB CONDITIONS**

A. Conform to applicable sections of DIVISION 31 + 32 for requirements relating to sub-grade preparation and DIVISION 3 for concrete work.

##### **PART 2 - PRODUCTS**

###### **2.01 MATERIALS**

A. Comply with DIVISION 3 sections for concrete formwork, reinforcing, materials, expansion joint material, curing, and quality control.

B. Use air-entrained concrete with 4% to 6% air content, 28-day compressive strength of 4000 psi. Design concrete mix in accordance with ACID 211.1. Slump shall be between 3-1/2 and 4-1/2 inches.

###### **2.02 FORMS**

A. Forms: Wood or steel, of an approved type and design, securely fastened and braced to prevent any movement during placing of concrete. Do not remove forms until at least twelve (12) hours after concrete has been placed.

###### **2.03 BASE**

A. Compacted sand cushion, thoroughly wetted prior to concrete placement, or as indicated on the Contract Drawings.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Prepare sub-base to required dimensions and grade.
- B. Remove loose material from compacted sub-base surface.
- C. Proof roll sub-base to check for unstable areas. Re-compact if necessary.

### **3.02 PLACEMENT**

- A. Place reinforcing, concrete expansion joint material, cure, and finish in accord with the applicable requirements in DIVISION 3.
- B. ADA standards will be strictly adhered too. No sidewalk will not be accepted with cross slopes greater then 2%, or slopes in the direction of travel greater then 12h:1v. Hand formed sidewalk shall be measured by hand for compliance. Sidewalk not meeting requirements shall be removed and replaced at contractors expense.

### **3.03 CONCRETE DECK PAVING**

- A. Slope for drainage as shown in drawings. In no case shall any part of any surface retain water.
- B. Provide expansion joints full depth of concrete at right angles to walks at intervals not greater than 20'-0"; also where any walk is confined between a curb and a fixed structure, or other relatively immovable object. Fill with non-extruding pre-molded joint filler to within 1" of top and seal as specified in Section SEALANTS AND CAULKING.
- C. Wood-float decks perfectly smooth. Before concrete has taken final set, provide an approved broom finish. Provide contraction joints (Scoring), 3/4" deep. Cut surfaces into approximate areas of not over twenty (20) square feet each, or as indicated. Finish all edges of each area with a 1/4" radius-edging tool.
- D. Provide ramps where indicated. Finish as specified for decks.

**END OF SECTION**

## **DIVISION 32 – EXTERIOR IMPROVEMENTS**

### **SECTION 32 16 13**

#### **CURBS AND GUTTERS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. Concrete curbs and gutters with sub-grade preparation, forms, reinforcing, finishing, and curing.

###### **1.02 JOB CONDITIONS**

A. Conform to applicable sections of DIVISION 31 for requirements relating to sub-grade preparation and DIVISION 3 for concrete work.

##### **PART 2 - PRODUCTS**

###### **2.01 MATERIALS**

A. Comply with DIVISION 3 sections for concrete formwork, reinforcing, materials, expansion joint material, curing, and quality control.

B. Use air-entrained concrete with 4% to 6% air content, 28-day compressive strength of 4000 psi. Design concrete mix in accordance with ACI 211.1. Slump shall be between 3-1/2 and 4-1/2 inches.

###### **2.02 FORMS**

A. Forms: Wood or steel, of an approved type and design, securely fastened and braced to prevent any movement during placing of concrete. Do not remove forms until at least twelve (12) hours after concrete has been placed.

###### **2.03 BASE**

A. Compacted sand cushion, thoroughly wetted prior to concrete placement, or as indicated on the Contract Drawings.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Prepare sub-base to required dimensions and grade.
- B. Remove loose material from compacted sub-base surface.
- C. Proof roll sub-base to check for unstable areas. Re-compact if necessary.

### **3.02 PLACEMENT**

- A. Place reinforcing, concrete expansion joint material, cure, and finish in accord with the applicable requirements in DIVISION 3.
- B. Curb may be placed through the use of a slipforming machine.
- C. Slope for drainage as shown in drawings. In no case shall any part of any surface retain water.
- D. Provide expansion joints full depth of concrete at right angles to curbing at intervals not greater than 20'-0".
- E. Provide ramps where indicated. Trowel finish all curb and gutter surface.

**END OF SECTION**

## **DIVISION 2 - SITEWORK**

### **SECTION 32 31 00**

#### **SANITARY SEWERS AND APPURTENANCES**

##### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

A. The Contractor shall furnish all material for and shall construct the pipe lines and all required appurtenances at the locations to the lines, slopes and elevations shown on the drawings or designated by the Engineer.

B. Related work specified elsewhere:

1. Submittals: Section 01 33 00.
2. Dewatering: Section 31 23 19.
3. Site Preparation and Rough Grading: Section 31 22 13.
4. Utility Excavation and Backfill: Section 31 23 18.
5. Precast Manholes: Section 32 47 00.
6. Painting: Section 09 91 00.

##### **1.02 QUALITY ASSURANCE**

A. General: The Contractor shall furnish all labor, tools, materials, water and equipment, including mirrors, flashlights or other artificial lighting, weirs, pump, compressors, stopwatch, gauges and meters for testing in accordance with these specifications.

B. Reference Standards

1. American National Standards Institute:
  - a. ANSI A21.4, Cement Mortar Lining for Cast Iron and Ductile Iron Pipe and Fittings for Water.
  - b. ANSI A21.10, Gray Iron and Ductile Iron Fittings, 2 through 48 inches, for Water and Other Liquids.
  - c. ANSI A21.11, Rubber Gasket Joints for Cast Iron and Ductile Pressure Pipe and Fittings.
  - d. ANSI A21.15, Flanged Cast Iron and Ductile Iron Pipe with Threaded Flanges.
  - e. ANSI A21.50, Thickness Design of Ductile Iron Pipe.
  - f. ANSI A21.51, Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

- g. ANSI/AWWA C153/A21.53-06 Standard for Ductile Iron Compact Fittings, 3 Inches Through 24 Inches (76 MM through 610 MM), 30-inches through 48-inches (762 mm through 1,219 mm), and 54-inches through 64-inches (1400 mm through 1600 mm) for Water Service
- 2. American Society for Testing and Materials:
  - a. ASTM A47, Malleable Iron Castings.
  - b. ASTM A48, Gray Iron Castings.
  - c. ASTM C700.
  - d. ASTM D2241.
  - e. ASTM F477.
  - f. ASTM A536-84 Standard Specification for Ductile Iron Castings
  - g. ASTM D1784 Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds.
  - h. ASTM D2241 - Standard Specification for Polyvinyl Chloride (PVC) Pressure Rated Pipe (SDR Series).
  - i. ASTM D2412 - Test Methods for Determination of External loading Characteristics of Plastic Pipe by Parallel Plate Loading.
  - j. ASTM D2321 - Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
  - k. ASTM D2466 - Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.
  - l. ANSI/ASTM D2774 - Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.
  - m. ASTM D3139 Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
  - n. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes using flexible elastomeric seals.
  - o. ASTM F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- 3. Federal Specifications:
  - a. Fed. Spec. SS 168 (2), Sealing Compound, Sewer, Bituminous, Two Component, Mineral Filled, Cold Applied.
  - b. Fed. Spec. SS 210A, Sealing Compound, Preformed Plastic, For Expansion Joints and Pipe Joints (Type 1 Rope Form).

**Note:** All references listed shall be the latest version thereof.

### 1.03 SUBMITTALS

A. Shop Drawings and Product Data. Furnish completely dimensioned shop drawings, cuts or other data as required to provide a complete description of piping and appurtenances as specified.

- 1. Contractor will be required to submit complete dimensional layouts of

interior and exterior piping systems for approval. These layouts must be coordinated with equipment and valves to be furnished.

B. Certifications: The Contractor shall submit manufacturer certifications for pipe, fittings, linings and materials to the Engineer for approval. Certifications shall state that pipe furnished complies with standards specified herein.

#### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

A. Packing Lists: Packing lists shall accompany each pipe delivery made to the site. Absence of such list may cause refusal of shipment.

1. Packing lists shall indicate customer's order number or contract number, truck routing, type and classes of pipe, pipe diameters, weights and lengths of pipe, date of manufacturer, plant identification of the particular lots of piping contained in the shipment.
2. Submit a copy of packing lists to the Inspector or Engineer as soon as practicable after delivery of piping.

B. Handling: Exercise care not to damage exterior coatings and linings of pipes during loading and unloading operations.

1. Use lifting devices or harnesses of the type recommended by pipe manufacturers in handling pipes.
2. Do not drop pipe and pipe fittings, valves and appurtenances.

C. Storage: Store pipe, fittings, valves and appurtenances so as not to contact earth or other contaminants.

### **PART 2 - PRODUCTS**

#### **2.01 GENERAL**

A. All sewer pipe shall be polyvinyl chloride (PVC), or as shown on the contract drawings.

#### **2.02 POLYVINYL CHLORIDE PIPE AND FITTINGS**

A. Polyvinyl chloride (PVC) pipe, used for sewer construction for pipe depths less than 20 feet, shall equal or exceed the requirements of ASTM D 3034 for 6-inch through 15-inch pipe and ASTM F679 for 18-inch through 27-inch pipe. The PVC sewer pipe shall have a minimum standard dimension ratio (SDR) of 35 and the minimum pipe stiffness, as tested in accordance with ASTM D 2412, shall be 45 psi when measured under 5 percent deflection at 73 degrees Fahrenheit. Pipe shall be manufactured with integral wall bell and spigot joints in standard lengths not exceeding 20.0 feet.

B. All polyvinyl chloride (PVC) pipe and fittings shall utilize an elastomeric O-ring gasketed joint assembled in accordance with the manufacturer's recommendations. All seals shall be securely locked in place to prevent displacement. Gaskets shall have a minimum cross sectional area of 0.20 square inches and conform to ASTM F-477 specification. Provide all necessary adapters.

C. Polyvinyl chloride wye branches, repair couplings, tee wyes, pipe stoppers and other fittings shall be manufactured in accordance with the same specifications. All PVC sewer fittings shall be SDR26 Heavy Duty fittings unless otherwise noted on the plans as requiring C-900 PVC fittings. All sewer fittings shall be as manufactured by Harco, or Plastic Trends. PVC sewer fittings shall conform to ASTM D-3034. Fittings in sizes through 8" shall be molded in one piece with elastomeric joints and minimum socket depths as specified in sections 6.2 and 7.3.2. Fittings 10" and larger shall be molded or fabricated in accordance with section 7.11 with manufacturers standard pipe balls and gaskets. Saddle fittings shall not be acceptable. PVC material shall have a cell classification of 12454-B or C as defined in ASTM D-1784. Fittings shall be Harco, Plastic Trends or approved substitution.

D. Polyvinyl chloride pipe shall be delivered and stockpiled in unit pallets. Stacking of pallets above 5 feet in height will not be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective material to protect the pipe from ultra-violet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

E. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed on this project.

F. All PVC sewer pipe shall be CertainTeed PVC sewer pipe, or approved substitution.

### **2.03 LATERALS**

A. The Contractor shall furnish and lay, or install, all sewer service pipes, fittings, and appurtenances in accordance with these specifications and as indicated on the Contract Drawings.

B. All PVC branches shall be located in the position designated by the Engineer or his representative. Short pieces of lateral sewer shall be field cut to meet this condition. The Contractor shall have on the site, at all times, factory approved equipment to machine cut the end of short pieces of pipe to fit standard couplings and jointing materials.

C. All sewer house laterals shall be installed as described in section 3.01 PVC Pipe Installation.

D. Laterals shall be laid at least 10-feet horizontally from any existing or proposed water mains. The distance shall be measured outside edge to outside edge.

E. Laterals crossing water mains shall be laid to provide a minimum vertical distance of 18-inches between the outside of the water main and the outside of the laterals. This shall be the case where the water main is either above or below the laterals. The crossing shall be arranged so that the laterals joints will be equal distance and as far as possible from the water main joints. Where a water main crosses under a lateral, adequate structural support shall be provided for the lateral to prevent damage to the water main.

F. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, concrete encasement shall be required to be installed a minimum of 5-feet each side of the crossing point on the lowest utility. See drawings for the encasement detail.

## **2.04 PIPELINE DETECTION SYSTEM**

A. See Section 02713 – Exterior Water System for details.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

A. All pipe, fittings and accessories shall be carefully lowered into the trench using suitable equipment in such manner as to prevent damage to pipes and fittings. Under no circumstances shall the pipe or accessories be dropped or dumped into the trench. Special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipe.

B. No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation unless all required precautions as to the minimum length of open trench and promptness of backfilling are observed.

C. Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravel, sills, or of concrete; all to be of the form and dimensions and placed in the manner required by the Engineer. All artificial foundations shall be of a character equal to that as hereinbefore specified.

D. The pipe and accessories shall be inspected for defects prior to lowering into the trench. Bowed sections of PVC pipe will not be acceptable. Any installation of pipe which has been bowed, whether or not the bow has been corrected, will not be allowed. Any defective, damaged or unsound material shall be repaired or replaced as directed

by the Engineer

E. Field Measurements:

1. The Drawings are in general indicative of the work, with symbols and notations for clarity. However, the drawings are not an exact representation of all conditions involved, therefore, layout piping to suit actual field measurements. No extra compensation will be made for work due to differences between indicated and actual dimensions.
2. Submit details of proposed departures necessitated by field conditions or other causes to the Engineer for approval.

### 3.02 PIPE INSTALLATION

A. General:

1. Clean piping prior to installation and following installation to prepare for painting. Keep open ends of piping and pipe attachment openings on equipment capped or plugged until actual connection so as to keep dirt and other substances from entering. The stopper shall be kept in the end of pipeline at all times when laying is not in actual progress.
2. Construct piping from full lengths of pipe using short sections only for runs of less than full pipe length. Make changes in direction of pipe runs with fittings only.
3. Cut pipe accurately to measurements established in the field and assemble in place without springing, forcing, excessive cutting or weakening of the structure. Work shall be done in a satisfactory manner so as to leave a smooth end.
4. All concrete required to support and reinforce wye branches, bends and other fittings shall be placed as directed, and the cost thereof shall be included and covered by the various items for furnishing and laying wye branches, bends and other fittings.
5. Backfill materials shall be hand placed and mechanically tamped in six inch layers, placed uniformly on both sides of the pipe, to a point at least one foot above the pipe crown. Each layer shall be thoroughly compacted for the full trench width and under, around and over the pipe. Mechanical tampers shall exert a pressure of not less than 250 foot pounds per square foot of area for tamping face.
6. A minimum vertical separation of 18 inches between water mains and sewer lines shall be maintained throughout the project. Where water mains and sewer lines cross, sewer pipes joints shall be equidistant from the intersection and as far from water main joints as possible.

B. Exposed Piping:

1. Run piping parallel or perpendicular to the lines of the structure. Keep

piping a sufficient distance from other work to permit clearance of not less than one inch between the piping or insulated piping and adjacent work. Install piping as close as possible to walls, overhead construction, columns, and similar to facilitate insulating work and removal of piping later.

2. Run piping to compensate for structural interferences, to preserve headroom, and not to interfere with openings, passageways and equipment.
3. Do not install piping with joints and fittings over motors, switchboards, panels, or similar electrical apparatus.
4. Install unions and flanges in accessible locations and where indicated or not, install union adjacent to all equipment and wherever removal of equipment for repair or replacement is required. Use dielectric unions at points of connection of copper tubing and piping to ferrous metal piping or equipment.

C. Underground Piping:

1. Perform trenching as specified previously in Section 02315 - UTILITY EXCAVATION, BACKFILL AND COMPACTION.
2. Unless indicated otherwise, piping outside of structures shall be installed with not less than 3' 0" of cover.
3. Keep trenches dewatered until pipe joints have been made and concrete bedding and blocking, if any, have hardened. Under no circumstances lay pipe in water or on subgrade containing frost.
4. Before pipe is placed, the bottom of the trench shall be carefully shaped to fit the lower part of the pipe exterior with reasonable closeness for a width of at least 60% of the pipe width as indicated on the plans.
5. Rest each section of pipe on pipe bedding for the full length of its barrel, with recesses excavated for pipe bells so joints can easily be made. Backfill recesses with bedding material immediately following pipe joining operations.
6. Take up and relay pipe that is not laid true to required alignment or grade or has its joints disturbed after laying. No deviation from the required line and grade permitted, except with approval of the Engineer. No pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place.

D. Laterals

1. The Contractor shall furnish and lay, or install, all sewer service pipes, fittings, and appurtenances in accordance with these specifications and as indicated on the Contract Drawings.
2. All PVC branches shall be located in the position designated by the Engineer or his representative. Short pieces of lateral sewer shall be field cut to meet this condition. The Contractor shall have on the site, at all

times, factory approved equipment to machine cut the end of short pieces of pipe to fit standard couplings and jointing materials.

3. All sewer laterals shall be installed as described in section 3.01 PVC Pipe Installation.
4. Laterals shall be laid at least 10-feet horizontally from any existing or proposed water mains. The distance shall be measured outside edge to outside edge.
5. Laterals crossing water mains shall be laid to provide a minimum vertical distance of 18-inches between the outside of the water main and the outside of the laterals. This shall be the case where the water main is either above or below the laterals. The crossing shall be arranged so that the laterals joints will be equal distance and as far as possible from the water main joints. Where a water main crosses under a lateral, adequate structural support shall be provided for the lateral to prevent damage to the water main.
6. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, concrete encasement shall be required to be installed a minimum of 5-feet each side of the crossing point on the lowest utility. See drawings for the encasement detail.

#### E. Pipe Joining:

1. General: Exercise care when making pipe joints and make joints in accordance with the pipe material manufacturer's recommendations and the following requirements. In each instance of pipe joining, those portions of pipes involved must be absolutely clean just prior to assembly. If a joint is extremely difficult to assemble or sealing is not affected, disassemble the joint and correct the difficulty if possible. Remake the joint using new materials when necessary.
2. Mechanical Joints: To make ductile iron pipe mechanical joint, position sealing gasket and gland for bolting and the enter the spigot into pipe bell end until joint line is visible. Tighten bolts evenly maintaining approximate distance between gland and face of flange at all points around the socket. Do not exceed pipe manufacturer's specifications for maximum torque applied to bolts.
3. Grooved end Joints: In accordance with grooved coupling manufacturer's recommendations.
4. Flanged Joints: Make ductile iron and steel pipe joints faced true, fitted with gaskets, and drawn up square and tight to insure full pipe flow and satisfactory seal.
5. Threaded Joints: Cut pipe ends square, deburr and ream to size of original bore. Cut threads to American Standard tapered pipe threads, free of oil and cuttings. Use an approved joint tape or join paste to aid in joint lubrication and sealing. After fabrication, paint exposed threads.
6. Soldered Joints: Cut tubing and piping ends square using a fine hacksaw blade or tube cutter, deburr and ream to size of original bore. Prior to

sweating, clean pipe ends and fittings surfaces involved in the joint, to bright metal without marring surfaces using steel wool, sand cloth or steel wire brush. Apply flux evenly and liberally to the outside end of the pipe and the inside of the outer end of the fitting until all surfaces are completely covered. Piping shall be slipped together and reworked to insure even flux distribution. Solder amount shall be per manufacturer's recommendations. Solder joints shall be made using direct torch flame. Finished joints shall show no evidence of hard temper due to overheating, no evidence of improper solder draw, and excess solder must be removed. Joints in compressed air systems shall be made with silver brazing alloy.

7. Flared Joints: Cut tubing and piping ends square, deburr and ream to size of original bore. Finished joints shall show evenness of flaring and proper seating of joining parts.

F. Field Touch up of Pipe Coating:

1. Prior to placement of coated pipe touch up chipped, cracked or abraded pipe surfaces with two coats of the previously specified coating material.
2. Bring coating materials for field touch up to job site in original sealed and labeled containers.
3. Contractor shall submit to the Engineer, immediately upon completion of field applied coating, certification from the manufacturer indicating that the quantity of each coating purchased was sufficient to properly coat all surfaces.
4. In addition to field touch up of pipe surfaces, thoroughly cover completed pipe joints with pipe coating material.

G. Marking Pipe and Fittings: Each length of pipe and each fitting shall be marked with the weight, class or nominal thickness, and casting period cast upon them. Each length of pipe and each fitting shall be marked with the manufacturer's identification and year of manufacture in a conspicuous location. Ductile iron pipe shall have the letters "DI" or "Ductile" cast or stamped on the pipe. All required markings shall be clearly legible.

### **3.03 TESTING**

A. Generally, piping, fittings and appurtenances will be tested from end to end. Pressure and leakage tests shall be performed.

B. The Engineer shall be notified in advance of all tests, and all tests shall be conducted to his entire satisfaction.

C. The Contractor shall furnish all labor, tools, materials, water and equipment required for testing unless otherwise directed by the Engineer or Owner. Equipment necessary for testing includes but is not limited to mirrors, flashlights or other artificial

lighting, weirs, pumps, compressors, stopwatches, gauges, and meters, subject to approval of the Engineer for testing in accordance with these specifications.

D. All sanitary sewers installed shall be subject to Mirror Testing and Deflection testing as specified below. In addition, the Contractor shall provide Exfiltration / Infiltration testing or Air testing as specified below.

1. Mirror Testing of Sanitary Sewers
  - a. Upon Completion of pipe laying and backfilling to a point of at least two (2) feet above the crown of pipe, the Engineer will conduct a mirror test to check for defects, or leakage, and for horizontal or vertical misplacement. Mirror testing shall consist of reflecting sunlight or artificial light via mirrors through the completed section of pipeline, which, in order to be accepted, shall be true and straight in horizontal and vertical alignment to allow full passage for the reflected light.
2. Deflection Testing of Sanitary Sewers
  - a. Sanitary sewers shall be tested in the presence of the Engineer and the Contractor's representative to determine the amount of vertical deflection in the completed pipeline. Deflection testing as specified hereinafter shall be accomplished by the Contractor on all sanitary sewers installed. Should significant failures be detected, additional deflection testing shall be performed by the Contractor. Installation of Sanitary sewers shall be complete prior to the start of deflection testing. All sheeting shall be removed except where written approval by the Engineer has been obtained. All backfill shall be placed, consolidated and dewatering operations ceased 14 days prior to the start of deflection testing. One of the following method of testing shall be utilized.
    - 1) A steel ball or mandrel with a diameter equivalent to 95% of the inside diameter of the pipe to be tested shall be pulled through the pipeline, from manhole to manhole, by hand. If it is unable to pass through the pipe without applying excessive force (as judged by the Engineer), it will be considered as evidence that the pipe has deflected more than 5% of the inside pipe diameter. A permanent record of all testing locations where excessive pipeline deflections occur shall be kept by the Contractor and forwarded to the Engineer after the completion of testing of each line. The mandrel shall be approved by the Engineer prior to use. Mandrels shall have an odd number of gaging plates. The minimum number of plates shall be nine (9) with a contact surface length equal to the inside diameter plus two (2) inches for pipelines 10 inches in diameter and smaller. On larger diameters, the contact surface length shall equal the inside pipe diameter. The Contractor shall immediately

replace all sections of pipe which deflect more than 5% as measured by the foregoing method.

- 2) A Deflectometer or similar instrument, either of which must be approved for use by the Engineer shall be pulled through the pipeline from manhole to manhole. The instrument shall measure the vertical deflection in the pipeline to the nearest tenth of 1%. A permanent record of all testing with the locations where excessive pipe deflections (greater than 5% of inside diameter pipe) occur shall be kept by the Contractor and forwarded to the Engineer after completion of testing each line. The Contractor shall immediately replace all sections of pipe which deflect more than 5% as measured by the foregoing method.
- b. Lateral lines shall be tested by the Deflectometer method. Mirror and deflection testing are not required for laterals.
3. Leak Testing: Infiltration and Exfiltration Tests
  - a. Leakage, whether infiltration or exfiltration shall not exceed a rate of ten gallons per inch of diameter per mile of sewer per twenty-four hours in any section of piping between successive manholes.
  - b. Infiltration testing shall take place when the natural ground water table is above the crown of the piping at the higher end of the TEST SECTION. The amount of leakage shall be measured by a suitable weir or other devices as directed and approved by the Engineer.
  - c. Exfiltration testing shall take place when the natural ground water table is below the sewer piping. Testing shall be made of each section as directed herein or by the Engineer. A section of sewer line shall be prepared for testing by plugging the upper side of the downstream manhole and all openings in the next upstream manhole except the downstream opening. The maximum head on any section under test will not exceed thirty feet for PVC pipe. Branch sewers running from Y-branches on the MAINS shall be plugged at the upper end (C.O. location) if the test head would cause them to overflow.
    - 1) A section of sewer line prepared as above shall be tested by filling it with water to an elevation of two (2) feet above the top of the pipe in the upstream manhole, in mains without laterals or the test head must exceed the highest house service elevation, whichever is greater. The water should be introduced into the test section at least four hours in advance of the official test period to allow the pipe and joint material to become saturated with water. All entrapped air shall be removed prior to performance of test.
    - 2) At the beginning of test the elevation of the water in the upper manhole shall be carefully measured from a point near the water level such as a manhole rung. After a period of six hours or more, with the approval of the Engineer, the water

elevation shall be measured from the same point on manhole rung and the LOSS of water during test period calculated. Sewer section showing leakage in excess of that allowed shall be repaired or reconstructed as necessary then retested.

- d. The Contractor shall test sewer sections immediately upon completion thereof not exceeding more than 1000 foot lengths and shall meet the appropriate requirements specified herein. All sheeting shall be removed, backfill placed to finished grade, and dewatering operations ceased at least 48 hours prior to infiltration tests.
  - e. The Contractor shall replace or repair all visible leaks or defects in all sections of sewers failing to meet the leakage tests.
4. Air Testing
- a. All sanitary sewers shall be tested with air under low pressure in accordance with subsequent designated procedures, and will not be accepted by the Owner until the sewers meet with the specified criteria. Pressure gauges, stop watches, air compressor, hoses, plugs, and test supervision shall be furnished by the Contractor. All tests shall be conducted by the Contractor in the presence of the Engineer. The Contractor shall not be permitted to place air under pressure in any sewer under any circumstances except those explicitly mentioned herein.
  - b. All sanitary sewers, including manholes, shall be inspected prior to air testing and any water leakage into the system sufficient to constitute any noticeable trickle or dribble shall be corrected and eliminated prior to undertaking the low pressure air test.
  - c. Whenever it has been necessary to construct underdrains or place gravel under pipelines in order to dewater the trench during construction of the sewers, the air test shall not be made until any pumps which have been used in the dewatering process have been removed from the site.
  - d. Before any air test is scheduled, the Contractor shall have completed all backfill operations including compaction testing.
  - e. The Contractor shall schedule all air tests with the Engineer at least 48 hours in advance thereof. Each section of completed sewer shall be tested. Generally, the sewers will be tested from manhole to manhole or from a manhole to the terminus of the sewer if there is no manhole at the other extremity.
  - f. The test procedure shall be conducted in the following manner:
    - 1) The Contractor shall thoroughly clean and remove all debris, silt, earth, or other material from the sewer prior to air testing. The pipe may be cleaned with water in a manner approved by the Engineer. None of this water or debris shall be allowed to enter the existing sewer.
    - 2) All branch fittings and end of laterals stubs shall be securely

plugged to withstand the internal test pressures. The section of line being tested shall also be securely plugged at each manhole. All stoppers shall be adequately braced when required.

- 3) If the pipe to be tested is expected to be below the groundwater table, the Contractor shall install either a small diameter perforated vertical pipe from the invert elevation of the sewer to the surface prior to backfilling or shall insert a pipe probe by boring or driving into the backfill material adjacent to the invert elevation of the pipe and shall determine the depth of the groundwater level above the pipe invert immediately prior to air testing the sewer. All gauge pressures in the test shall be increased by the amount of this back pressure due to groundwater submergence over the end of the probe.
- 4) The Contractor shall add air slowly through a single control panel to the portion of the pipe under test until the internal air pressure is raised to 4.0 psi gauge greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe at the time of the test. However, the internal air pressure in the sealed line shall not be allowed to exceed 8 psig. When the maximum pressure exerted by the groundwater is greater than 4 psig, the Contractor shall conduct only an infiltration test.
- 5) As a safety precaution, no one shall be allowed in a manhole after the air pressure is increased in the sewer line. If the Engineer suspects that the test plug may be leaking, the pressure first shall be relieved before any adjustments are made to eliminate air leakage at the plug. The Contractor may precoat the plug with a soap solution to check the plug for leakage.
- 6) The Contractor shall allow the air temperature to stabilize for at least 2 minutes with the pipe subjected to an internal pressure of 4.0 psi by adding only the amount of air required to maintain this pressure.
- 7) After a 2-minute period, the Contractor shall completely disconnect the hose and compressor from the pipe being tested to assure that no additional air is added therein.
- 8) The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease 1 lb/square inch.
- 9) The line shall be considered acceptable if the time, in seconds required for a 1 psi pressure drop is not less than the following:

$$T = 0.0850 DQ/K$$

Where:

K= 0.000419 DL, but not less than 1.0

Q= rate of loss of 0.0015 cu. ft/min/sq. Ft. of internal surface.

D= Pipe Diameter, in.

L = Length of line being tested, ft.

See the attached table 1 for specification time required for a 1 psig pressure drop for size and length of pipe indicated for Q=0.0015.

The Contractor shall use a standard air test data sheet for all air tests.

- 10) When the sewer section to be tested contains more than one size of pipe, the minimum allowable time shall be based on the largest diameter pipe in the section.
  - 11) Pipe which fails to maintain the stipulated pressure for a period equal to or greater than the holding time shown in the tables shall be deemed to have failed to pass the low pressure air test and is unsatisfactory for acceptance by the Owner. Any sewer that fails to pass this test shall be repaired by the Contractor at his own expense. Following repairs, the sanitary sewer shall be tested again in accordance with the designated procedures.
5. Sewer Invert Verification:
- a. Owner shall select, employ and pay for services of an Independent Surveyor to perform field verification of sewer line invert elevations at manholes and between manholes during the course of the work.
  - b. Contractor shall cooperate with surveyor to facilitate execution of its required services.
  - c. Contractor shall immediately replace all sections of pipe which show invert elevations which deviate from approved cut-sheet submittals.

E. Drain System:

1. Hydrostatic at not less than 10 foot head of water, except when danger of freezing, then conduct tests with air pressure.
2. Air Test: Introduce compressed air in any suitable opening, after closing all other inlets and outlets, until there is a uniform gauge pressure of 10 psi. Maintain pressure without introduction of additional air for a period of at least 15 minutes.

F. Leaks and defects shall result in the pipe being repaired, replaced or otherwise remedied by the Contractor at no expense to the Owner and to the complete satisfaction of the Engineer. Repair or replacement of pipe shall be accomplished when

leaks become apparent and shall be completed within one month after detection of leak but prior to Owner's final acceptance of the project

### **3.04 DEFECTS TO BE MADE GOOD**

A. If, at any time before the expiration of the guarantee period under this contract, any broken pipe, humps, sags, settlements, bellies, or any other defects are found in any of the lines or in any of the appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default, or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects prior to installation, and any found defective shall be rejected for use.

**END OF SECTION**

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**TABLE 1**

**SPECIFICATION TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP  
FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015**

1 PIPE DIAMETER (INCH)	2 MINIMUM TIME (MIN:SEC)	3 LENGTH FOR MINIMUM TIME (FT)	4 TIME FOR LONGER LENGTH (SEC)	SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN:SEC)								
				100 FT	150 FT	200 FT	250 FT	300 FT	350 FT	400 FT	450 FT	
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24	
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24	
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48	
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38	
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04	
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31	
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33	
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48	
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15	
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53	
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46	

### AIR TEST DATA SHEET

OWNER (Name of City, District, etc.) \_\_\_\_\_ Test No. \_\_\_\_\_  
 Identification of Pipe Installation (Job name, location, contract number, etc.) \_\_\_\_\_

FIELD TEST DATA: (To be filled in by the Inspector)

DATE: \_\_\_\_\_ Specified Maximum Pressure Drop: \_\_\_\_\_ psig

Identification of pipe material installed \_\_\_\_\_

PIPE UNDER TEST				SPECIFICATION TIME	FIELD TEST OPERATIONS DATA					
UPSTREAM MH STA 1	DOWNSTREAM MH STA 1	DIA. D (IN.)	LENGTH L (FT.)	Refer to UNI-B-6 (min:sec)	Pressure Initially Raised To (psig)	Time Allowed For Pressure to Stabilize (min)	Start Test Pressure (psig)	Stop Test Pressure (psig)	ELAPSED TIME (MIN:SEC)	PASS OR FAIL (P OR F)

INSPECTORS' NAME AND TITLE: \_\_\_\_\_  
 SIGNATURE OF INSPECTOR \_\_\_\_\_

If a section fails, the following items should be completed:  
 Identify section(s) that failed \_\_\_\_\_  
 Leak (was) (was not) located. Method used: \_\_\_\_\_  
 Description of leakage found: \_\_\_\_\_  
 Description of corrective action taken: \_\_\_\_\_  
 For test results after repair refer to Test No. \_\_\_\_\_, Inspector \_\_\_\_\_

## **DIVISION 32 – SITEWORK**

### **SECTION 32 32 00**

#### **EXTERIOR WATER SYSTEM**

##### **PART 1 – GENERAL**

###### **1.01 SECTION INCLUDES**

A. Furnishing and installing all water mains, valves, hydrants, fittings and appurtenances in accordance with these specifications, as indicated on the Drawings, and as required to complete the work.

###### **1.02 PVC WATER MAIN PIPE AND FITTINGS**

A. Polyvinyl chloride (PVC) plastic pipe used for water main construction shall meet or exceed the requirements of AWWA C 900 latest edition. It shall have outside diameters equal to cast iron pipe with a standard dimension ratio (SDR) of 18. The pipe shall be rated for a working pressure of at least 150 psi plus a surge allowance of at least 35 psi and shall have a minimum ultimate hydrostatic strength of 600 psi.

B. Polyvinyl chloride pipe and fittings shall be manufactured with integral wall bell and spigot joints which shall utilize a flexible O-ring rubber gasketed joint conforming to ASTM D 3139, "Joints for Plastic Pressure Pipe Using Flexible Elastomeric Seals". Pipe ends shall be beveled to accept gasketed fittings.

C. Pipe shall be manufactured in lengths not to exceed 20 feet.

D. Each pipe section including bell or coupling shall be subjected to a hydrostatic test of not less than 500 psi for at least 10 seconds. Pipe shall be tested in accordance with conditions specified in ASTM D 618. Any pipe that leaks or is unable to withstand the test pressure shall be rejected. The test shall be conducted at the factory and certification stating that the test has been conducted as specified and the pipe meets all conditions of this specification shall be submitted.

E. All fittings for PVC water pipe shall be made of cast iron in accordance with ANSI Standard A21.10. Fittings shall be class 250 and provided with mechanical joint ends furnished in accordance with ANSI Specification A21.11 except where noted on the Drawings or delineated in these specifications. Ductile iron fittings will be an acceptable alternate. Ductile iron fittings shall be mechanical joint with a 350 psi pressure rating conforming to ANSI Standard A21.53 and A21.11. Inside of fittings shall be double cement lined with a bituminous seal coat in accordance with ANSI 21.4. Outside of fittings shall also be bituminous seal coated.

F. Polyvinyl chloride pipe specified herein is manufactured to cast iron pipe size. However, if adapters for connecting polyvinyl chloride pipe to cast iron fittings and valves are necessary, they shall be of the type recommended by the pipe manufacturer. Adapters must be manufactured of material specified herein or approved by the Engineer. Furnishing and installing adapters shall be included in the unit prices bid for the pipe.

G. Polyvinyl chloride pipe shall be delivered and stockpiled in unit pallets, and stored on a flat surface. No stacking of pallets above 5 feet in height will be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective materials to protect the pipe from ultra-violet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

H. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed.

### **1.03 VALVE BOXES**

A. Valve boxes shall be cast iron, two-piece slip with 5-1/4 inch shafts and No. 6 round bases. Valve boxes shall be adjustable between the limits of 2'-4" and 3'-4". If necessary, the water main shall be lowered to provide adequate depth of installation of the valve box.

B. Lids shall be extra deep with two holes and the word "WATER" cast in the upper surface.

C. Valve box assemblies shall be as manufactured by Tyler, Model 564A, or approved equal.

### **1.04 TAPPING SLEEVE & VALVE**

A. Valves shall be cast iron, American Flow Control Series 2500 or approved substitution.

B. Install valve per manufacturer's recommendations.

### **1.05 TAPPING SLEEVE & VALVE**

A. Tapping sleeves shall be of all stainless steel construction including sleeve, bolts and nuts. Sleeves shall wrap 360 degrees around the pipe with gridded full circumference gasket. Units shall be FAST Model by Ford Meter Box Co., or approved substitution.

B. Tapping valves shall be cast iron, American Flow Control Series 2500 or approved substitution.

C. Install tapping sleeve and valve per manufacturer's recommendations.

#### **1.06 LAYING PVC WATER MAIN AND FITTINGS**

A. PVC pipe shall be installed in accordance with AWWA C 605, latest revision. Pipe and fittings shall be carefully handled and lowered into the trench. The ends of pipe shall abut against each other in such manner that there shall be no shoulder or unevenness on the inside of the main.

B. Use lubricants specified and supplied by pipe manufacturer and approved for water service for proper pipe joint installation.

C. Special care shall be taken to insure that the pipes are well bedded on a solid foundation, and any defects due to settlement shall be made good by the Contractor at his own expense. Bell holes shall be dug sufficiently large to insure the making of proper joints.

D. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipes and fittings shall be used. Care shall be taken to prevent the pipe wall from being damaged, and any wall damage shall be repaired to the satisfaction of the Architect by the Contractor.

E. Pipe and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. At the close of each work day, the end of the pipeline shall be tightly closed with an expansion type stopper or plug so that no dirt or other foreign substance may enter the line, and this stopper or plug shall be kept in place until pipe laying is again resumed.

F. Whenever a pipe or fitting requires cutting, to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end, and without extra compensation. Polyvinyl chloride pipe shall be beveled in accordance with manufacturer's recommendation before making pipe joint.

G. In jointing pipe and fittings, the Contractor shall exercise particular care to insure that the outside of the spigot and inside of the bell are entirely free of oil, tar and greasy substances to insure a tight fit.

H. All concrete required to construct buttresses behind plugs, tees, bends and other fittings and anchorages above or beneath vertical bends shall be placed as directed and/or as shown on the Drawings. Concrete shall be 3,000 psi, with Type II Portland cement. The cost of concrete buttressing shall be included in the appropriate unit prices bid for furnishing and laying water main.

I. When indicated or as noted on the Drawings, water pipe shall be encased with 3,000 psi concrete, with Type II Portland cement.

### **1.07 INSTALLING FITTINGS, GATE VALVES AND VALVE BOXES**

A. Fittings, gate valves and valve boxes shall be placed along the water mains at the locations indicated on the drawings or where otherwise designated by the Owner or Architect.

B. A valve box shall be carefully placed over the bonnet of the gate valve with the top at the finished grade elevation of the ground elevation or at such other elevation as the Architect shall direct. It shall be set plumb. In tamping the backfill around the box, special care shall be taken to keep the box plumb and to have it firmly supported so as to avoid settlement. Any box which is found out of plumb, or which is not firmly supported, shall be excavated and reset in a satisfactory manner, at the Contractor's expense.

### **1.08 STERILIZATION OF WATER MAINS**

A. The Contractor shall disinfect all water mains in accordance with AWWA Standard C 651, latest edition.

B. The Contractor shall place in each length of pipe, and other appurtenances, a sufficient amount of HTH tablets to insure adequate disinfection treatment of the main after its completion. Tablets shall be fastened to the inside top of every length of pipe as laid, using "Permatex No. 2" gasket cement.

C. The Contractor will be responsible for securing a minimum residual chlorine content of 5 parts per million (ppm) at the extremities of the water mains after a minimum of twenty-four (24) hour contact with the water under full pressure on the main.

D. Water for filling the mains shall be introduced at a velocity of less than 1 foot per second in order to permit the HTH to completely dissolve and have a reasonably uniform distribution throughout the mains.

E. After the chlorine has been in contact with the mains for a minimum of twenty-four (24) hours, samples collected from the extremities of the mains shall indicate a residual chlorine content of 5 ppm or more.

F. If less than 5 ppm residual chlorine is indicated, the system shall be drained and the disinfection treatment repeated.

G. If samples collected at the extremities indicate a residual chlorine of 5 ppm or more, the system shall be drained and flushed until there is only a normal chlorine

residual (1.0 ppm or less) present, as determined by the DPD Method Test. Samples of water shall be collected from various points along the lines, by the State Board of Health for bacteriological analysis. If satisfactory bacteriological results are obtained, the lines may then be allowed to be placed in service. A copy of all test results shall be submitted to the Inspection Agency and Architect.

## **1.09 TESTING**

A. The Contractor shall furnish all labor, tools, materials, including water, and equipment, including pumps, compressors, stopwatch, gauges, and meters subject to the approval of the Architect and Inspection Agency for testing and/or replacement/repair of pipe in accordance with these specifications.

B. The Contractor shall perform all testing and/or replacement/repair of the pipe in the presence of the Owner, Architect or designated representative. The cost for the Contractor's testing procedures shall be included in the prices bid for furnishing and laying water mains.

C. The Owner, Architect or Inspection Agency shall be notified in advance of all tests, and all tests shall be conducted to their entire satisfaction. All tests shall be conducted in the presence of the Inspection Agency.

### **D. Pressure Test**

1. After backfilling has been completed, all newly laid pipe and any valved section thereof shall be subject to a hydrostatic pressure test of 150 psi for two hours with the pressure measured at the highest elevation on the line. The procedure for the pressure test shall be as follows:
  - a. Each valved section of pipe shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Architect and Inspection Agency.
  - b. Before applying the specified test pressure, all air shall be expelled from the pipe. If permanent air vents are not located at all high points, the Contractor shall install corporation stops at such points so the air can be expelled.

### **E. Leakage Test**

1. After satisfactory completion of the pressure test, the Contractor shall conduct a leakage test. The Contractor shall furnish the gauge and measuring device for the leakage test. The Contractor shall furnish the pump, pipe connections, and other necessary apparatus. Leakage shall be defined as the quantity of water that must be supplied into a newly laid pipe or any valved section, to maintain the specified leakage test pressure.

2. After the air in the pipeline has been expelled and the pipe has been filled with water, the allowable leakage shall be not more than 25 gallons of water per inch diameter of pipe per mile or pipe tested per 24 hours at a pressure of 100 psi, measured at the highest line elevation. Leakage test shall be carried out for not less than eight hours duration and the allowable leakage prorated accordingly.

F. Should either test shown the main to be defective, the Contractor shall remedy such defects and retest the main as specified above. This procedure shall be repeated until the test requirements are met. Contractor is to bear full responsibility and cost for testing, repair, replacement, and retesting, at no additional cost to the Owner.

#### **1.10 LAYING PIPE IN FREEZING WEATHER**

A. No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Architect shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation, unless all required precautions as to the minimum length of open trench and promptness of refilling are observed.

#### **1.11 ARTIFICIAL FOUNDATION**

A. Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravel or concrete, all to be of the form and dimensions, and placed in the manner required by the Architect. All necessary excavation for the construction of artificial foundations shall be made by the Contractor.

#### **1.12 PIPELINE DETECTION SYSTEM**

A. Pipeline detection tape shall be installed continuously along all water mains. The tape shall be installed directly above the water mains and twelve inches from the ground surface.

B. The tape shall be Lineguard Type III Detectable Tape as manufactured by Lineguard, Inc., of Wheaton, Illinois, or approved substitution. The tape shall be a minimum of two inches wide, blue in color, imprinted with the words, "CAUTION--WATER LINE BELOW", and be capable of being detected with inductive methods.

#### **1.13 DEFECTS TO BE MADE GOOD**

A. If, at any time before the final acceptance of the contract, any broken pipes, or any defects, are found in the water mains or in any of their appurtenances, the Contractor shall cause the same to be removed and replaced with proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default or negligence

on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects, just before placing, and any found defective shall not be placed in the line.

## **1.14 BUTTRESSES AND ANCHORAGES**

A. Buttresses and anchorages shall be placed behind all caps, horizontal bends and branches. Reducers shall be buttressed as shown on the plans. Anchorages shall be placed beneath all vertical bends. These buttresses and anchorages shall be of concrete and steel, as required. They shall extend to solid, undisturbed soil and shall be constructed in accordance with the standard details or as shown on contract drawings.

### **PART 2 – PRODUCTS**

Not used.

### **PART 3 – EXECUTION**

Not used.

**END OF SECTION**

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## **DIVISION 2 – SITE WORK**

### **SECTION 32 40 00**

#### **STORM DRAINAGE**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

A. This Section includes gravity-flow, nonpressure, storm drainage outside the building, with the following components:

1. Special fittings for expansion and deflection.
2. Cleanouts.
3. Drains.

###### **1.02 DEFINITIONS**

- A. EPDM: Ethylene-propylene-diene-monomer rubber.
- B. HDPE: High Density Polyethylene plastic.
- C. PP: Polypropylene plastic.
- D. PVC: Polyvinyl chloride plastic.

###### **1.03 PERFORMANCE REQUIREMENTS**

A. Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: 2psi. Pipe joints shall be at a minimum soil tight, unless otherwise indicated.

###### **1.04 SUBMITTALS**

- A. Product Data: For the following:
1. Pipe and fittings.
  2. Storage and leaching chambers.

###### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Do not store plastic, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.

D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions.

## **1.06 JOB CONDITIONS**

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupies by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner no fewer than two (2) days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner's written permission.

## **PART 2 - PRODUCTS**

### **2.01 PIPING MATERIALS**

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

### **2.02 HDPE PIPE AND FITTINGS**

A. Corrugated HDPE Drainage Pipe and Fittings NPS 10 and Smaller: AASHTO M 252M, Type S, with smooth waterway for coupling joints.

1. Silt-tight Couplings: HDPE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
2. Soil-tight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.

B. Corrugated HDPE Drainage Pipe and Fittings NPS 12 to NPS 48: AASHTO M 294M Type S, with smooth waterway for coupling joints.

1. Silt-tight Couplings: HDPE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
2. Soil tight Couplings: AASHTO M 294M, corrugated matching pipe and fittings.

### **2.03 NONPRESSURE-TYPE PIPE COUPLINGS**

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Concrete Pipes: ASTM C 443, rubber.
2. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
3. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
4. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

C. Unshielded Flexible Couplings: Elastomeric sleeve with corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers:
  - a. Fernco Inc.
  - b. Approved substitution.

D. Ring-Type Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

1. Manufacturers:
  - a. Fernco Inc.
  - b. Approved substitution.

## 2.04 CLEANOUTS

A. Gray-Iron Cleanouts: ASME A 112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrulle with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.

1. Manufacturers:
  - a. Josam Company.
  - b. Approved substitution.
2. Top-Loading Classification(s): Heavy and Extra-heavy duty, H-20 loading minimum, to be used in paved areas.
3. 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.

1. Manufacturers:
  - a. Canplas Inc.
  - b. Approved substitution.
2. Top-Loading Classification(s): to be used in grassed areas only.

## **PART 3 - EXECUTION**

### **3.01 EARTHWORK**

A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

### **3.02 PIPING APPLICATIONS**

A. Gravity-Flow, Nonpressure Piping: Use the pipe material indicated on contract drawings. If pipe material is not called out contractor may chose between concrete, ductile iron, and HDPE pipe must meet the specifications of this section.

### **3.03 PIPING INSTALLATION**

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. Where specific installation is not indicated, follow piping manufacturer's written instructions.

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.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install 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. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at a minimum slope of .3%.
2. Install piping with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
3. Install piping with 12-inches minimum cover.
4. Install piping below frost line.
5. Install ductile-iron culvert piping according to ASTM A 716.

6. Install ductile-iron and special fittings according to AWWA C600 or AWWA M41.
7. Install HDPE corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
8. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

### **3.04 PIPE JOINT CONSTRUCTION**

- A. Where specific joint construction is not indicated, follow piping manufacturer's written instructions.
- B. Join gravity-flow, nonpressure drainage piping according to the following:
  1. Join ductile-iron culvert piping according to AWWA C600 for push-on joints.
  2. Join ductile-iron and special fittings according to AWWA C600 or AWWA M41.
  3. Join corrugated HDPE piping according to CPPA 100 and the following:
    - a. Use silttight couplings for Type 2, silttight joints.
    - b. Use soiltight couplings for Type 1, soiltight joints.
  4. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.
  5. Join dissimilar pipe materials with nonpressure-type flexible couplings.

### **3.08 DRAINAGE SYSTEM INSTALLATION**

- A. Assemble and install components according to manufacturer's written instructions.
- B. Install with top surfaces of components, except piping, flush with finished surface.
- C. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
- D. Fasten grates to channel sections if indicated.
- E. Assemble channel sections with flanged or interlocking joints.
- F. Embed channel sections in four (4) inches minimum concrete around bottom and sides.

### **3.09 IDENTIFICATION**

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

6. Use warning tape over ferrous piping.
7. Use warning tape over nonferrous piping and over edges of underground structures.

### **3.10 FIELD QUALITY CONTROL**

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after 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.

B. 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 report for each test.
  - a. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction.

C. Leaks and loss in test pressure constitute defects that must be repaired.

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

### **3.11 CLEANING**

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

**END OF SECTION**

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## **DIVISION 02 - SITE WORK**

### **SECTION 32 47 00**

#### **MANHOLES**

##### **PART 1 – GENERAL**

###### **1.01 DESCRIPTION**

A. The Contractor shall construct manholes of precast reinforced concrete risers and base sections where indicated and as detailed on the drawings. The Contractor will not be allowed to field cut, break, or core pipe openings through precast manhole walls.

B. Manholes shall be built at such points on the pipelines and of such form and dimensions as are shown on the drawings or as may be directed. Manholes shall be built as pipe laying progresses and the Engineer may stop work entirely on laying pipe if manhole construction is delayed to such an extent as to be hazardous to construction or the public.

###### **1.02 SUBMITTALS**

A. The Contractor shall submit certifications to the Engineer that all manhole sections, gaskets, pipe-to-manhole connectors, frames and covers, watertight inserts, and steps are as specified herein. Shop drawings shall be submitted for any proposed substitutions.

B. The Contractor shall furnish the Engineer with five (5) brick of the character he proposes using at least one week before any bricks are delivered for use.

C. The Contractor shall submit samples of the sand he proposes using in his mortar. These shall be retained in the office of the Engineer as a standard for comparison during the progress of the work, and all sand used shall be equal in quality to the accepted samples.

##### **PART 2 – PRODUCTS**

###### **2.01 PRECAST REINFORCED CONCRETE MANHOLE SECTIONS**

A. Precast reinforced concrete risers, eccentric cones (use of slab tops subject to Engineers approval or where shown on Drawings) and bases shall be as detailed on the drawings and in conformance with ASTM Designation C 478. Joints between riser

sections shall be fitted with a D-Lok manhole joint gasket meeting the requirements of ASTM Designation C 443. The seal between the manhole sections shall be in accordance with ASTM C 923.

B. Precast reinforced concrete base and riser sections shall be as manufactured by Atlantic Concrete Products Company, Virginia Precast Corporation, or equal. Base section shall be manufactured using a monolithic pour.

C. Lifting holes in the walls of precast reinforced concrete risers will be allowed. The lifting hole is to be formed by a plastic insert cast integrally into the manhole wall, to assure water tightness. Not more than two holes shall be cast in the walls of each riser section for the purpose of handling. Said insert is to be "Key-Lok" as manufactured by A-Lok Products or equal.

D. The manhole manufacturer is to identify all inlets and the outlet of each manhole. An "I" and an "O" painted over the hole will be acceptable.

E. Manholes with pipes 24" or more in diameter, or drop connections shall have an inside diameter of 5 feet. All other manholes are to have an inside diameter of 4 feet. Drop connections shall be inside the manhole. Outside drop connections will not be permitted.

F. Interior and exterior joint spaces of all manhole risers shall be mortared.

## **2.02 CONNECTIONS AND STUBS**

A. All pipe-to-manhole connections for sanitary sewer manholes shall be made by means of an integrally cast flexible connector which shall be Lockjoint flexible manhole sleeve as manufactured by Interpace Corp., Parsippany, New Jersey, or A-Lok flexible manhole gasket as manufactured by A-Lok Corp., Trenton, New Jersey, or equal.

B. All pipe to manhole connections for storm sewer manholes shall be grouted water and soil tight with non-shrink grout.

## **2.03 BRICK**

NOT REQUIRED

## **2.04 MORTAR**

A. Cement shall be in accordance with the "Standard Specifications for Portland Cement", ASTM Designation C 150 for Type II.

B. Sand shall be composed of sharp, angular, siliceous grains, coarse, or graded from fine to coarse with the coarsest grains predominating, and sensibly free from clay,

loam, dirt, mica, organic matter, or other impurities. Sand containing more than 5 percent by weight of foreign material shall not be used. This limit may be changed for special classes of work if hereinafter specified. Sand exhibiting more than an acceptable amount of fine matter or impurities may be required to be washed after delivery on the work or shall be rejected altogether. Sand for mortar shall be screened to reject all particles of a greater diameter than 1/4-inch and shall not contain more than 5 percent by weight of a very fine material.

C. Sand obtained from the excavation shall not be used.

## **2.05 MANHOLE STEPS**

A. Manhole steps shall be made of 5/8 inch diameter (No. 5) steel reinforcing bars, ASTM Designation A 615, Grade 60, encased in polypropylene plastic. Manhole steps shall have a notched tread ridge with retainer lug on each side.

B. Manhole steps shall be cast in place during manufacture of precast reinforced concrete risers and eccentric top sections. Embedment length shall be suitable for minimum 5 inch thick, precast reinforced concrete riser walls.

C. Manhole steps shall be OSHA approved and as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, ICM, Inc., Jacksonville, Arkansas, or equal.

## **2.06 MANHOLE FRAMES AND COVERS**

A. Material for frames and covers shall be in accordance with the standard specifications for gray iron castings ASTM Designation A 48 for Class No. 30 and as detailed on the Contract Drawings.

B. Frames and covers shall be Model 1545Z as manufactured by East Jordan Iron Works, or equal.

C. "Sanitary Sewer" or "Storm Water" shall be cast in the cover where applicable.

## **2.07 WATERPROOFING**

A. The exterior surface of all manholes shall receive a minimum two coat application of a 68 percent solids coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the manufacturer's instructions and coatings applied in the factory in a manner acceptable to the Engineer. The coating material shall be Bitumastic Super Service Black manufactured by Kop-Coat Inc., Pittsburgh, Pennsylvania, Tar-Jet Super Black XX-32-B-22 manufactured by Pennsbury Coatings Corp., New Britain, Pennsylvania, or equal. The Contractor shall be

responsible to repair areas of the coating damaged during handling and installation of the manholes.

## **2.08 FLOW CHANNELS**

A. All flow channels shall be formed of concrete in the bottom of vaults/inlets and shall slope smoothly and evenly from the pipes entering the vaults/inlets to the outlet pipe.

## **PART 3 – EXECUTION**

### **3.01 MANHOLE INSTALLATION**

A. Interior joint spaces of all manhole risers shall be mortared. The exterior joint may be mortared with hydraulic cement or filled with a joint filler compound. Said compound shall be Pioneer 301 as manufactured by Daubert Chemical Company, Oakbrook, Illinois, or equal.

B. Stub connections shall be constructed where indicated on the plans of the same material used for sewer construction and shall extend 2 feet in length with factory bell end outside the manhole wall. The outer end of the stub connection shall be plugged with an approved stopper and secured in place as directed.

C. Frames and covers for manholes shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.

D. Any excavation for manhole installation must be backfilled with imported material from an off-site borrow pit.

### **3.02 QUALITY ASSURANCE**

A. If inspection reveals any visible leakage or seepage in any manhole, the Contractor will be required to accomplish such remedial measures as may be directed by the Engineer. Caulking or patching of interior manhole surfaces will not be acceptable.

**END OF SECTION**

## **DIVISION 2 – SITEWORK**

### **SECTION 32 51 13**

#### **TRAFFIC SIGNS AND SIGNALS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Handicapped parking signs and posts.
- B. Traffic signage.

###### **1.02 SUBMITTALS**

- A. Fabrication drawings for review.

##### **PART 2 - PRODUCTS**

###### **2.01 MANUFACTURER**

- A. Best Sign Systems, Inc., Montrose, Colorado 81401.
- B. Approved substitution.

###### **2.02 MATERIALS**

- A. Handicapped Parking: Aluminum sign with baked enamel finish. Symbol and colors in accord with detail.
- B. Traffic Signs: Aluminum sign with baked enamel finish. Symbol and colors shall be in accordance with details and MUTCD requirements.
- C. Posts:
  - 1. U channel shape, hot rolled steel with baked enamel finish with 3/8" diameter holes spaced one (1) inch apart.
  - 2. Wood, four (4) inch by four (4) inch pressure treated.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Set post for signs in concrete. Concrete base shall have minimum dimensions of 8-inches in diameter set 36 inches deep into ground.
- B. Bolt sign to post using theft resistant fasteners.

**END OF SECTION**

## **DIVISION 32 – EXTERIOR IMPROVEMENTS**

### **SECTION 32 92 00**

#### **LAWNS AND GRASS**

##### **PART 1 - GENERAL**

###### **1.01 SECTION INCLUDES**

- A. Finish grading, topsoil, liming, fertilizing, seeding or sod, and maintenance for a specified period.
- B. Contractor, at his option, may substitute sod for seeding in areas to receive grass.
- C. The extent of this work includes areas shown within the limits of construction and other work disturbed by new construction.

###### **1.02 QUALITY ASSURANCE**

- A. Deliver packaged materials in containers showing weight, analysis, and name of manufacturer.

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

- A. Protect materials from deterioration during delivery, and while stored at site.

###### **1.04 GUARANTEE**

- A. Seeded areas to produce a dense, well-established and uniform turf. Repair any eroded, dead, or bare areas until accepted.
- B. Turf to be allowed to reach a height of three (3) to four (4) inches then mowed to a height of two (2) inches. Turf again allowed to reach a three (3) to four (4) inch height and mowed to a two (2) inch height.
- C. Upon completion of second mowing, turf will be accepted providing requirements herein have been met.

###### **1.05 MAINTENANCE**

- A. Maintain grassed areas for not less than sixty (60) days after acceptance of project.

- B. Include watering, fertilizing, weeding, mowing, trimming and other operations required to establish a smooth, acceptable lawn, free of eroded or bare areas.
- C. Reseed or replace areas damaged by construction processes or personnel.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. All materials to conform to those stipulated, unless otherwise approved in writing by Architect.
- B. Specified materials to be applied in amounts and methods herein stipulated.
- C. Delivery tickets, indicating date, weight, analysis, and vendor's name to be submitted to Architect.
- D. Grass seed to be fresh new-crop seed complying with purity and germination requirements stipulated herein and free of noxious grasses.
- E. Fertilizer: Granular 10-10-10 mineralized containing 2% magnesium, applied uniformly at an initial rate of fifteen (15) pounds per 1000 sq. ft. No cyanamide compounds or hydrated lime to be permitted in mixed fertilizers. Fertilizer shall comply with applicable state laws.
- F. Topsoil: Secure from off-site stockpile. Topsoil shall be free of weeds, debris, and root mat.
- G. Lime: Dolomitic limestone for agricultural purposes. Apply lime evenly at a rate of fifty (50) pounds per 1000 sq. ft.
- H. Seed: State of Delaware Department of Agriculture certified. Provide Architect with certified labels.

<u>Type</u>	<u>% Total</u>	<u>% Purity</u>	<u>%Germination</u>
Kentucky 31 Tall Fescue	90	98	90
Kentucky Blue Grass Baron, Biota or Birka	10	98	85

- I. Sod: Fresh cut perennial grass lawn, clean of weeds, and at least one (1) inch thick. Match the adjacent grass type where seeding is used.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Prepare disturbed areas within project limits where indicated for seeding by bringing ground surface to grades indicated.
- B. Grade to four (4) inches below finish grade. Loosen sub-grade to depth of four (4) inches.
- C. Spread topsoil from approved source to a settled depth of four (4) inches.
- D. Soil Preparation: Prior to seeding, prepare surface areas to receive same, as follows:
  - 1. Rake entire area free of debris, organic or inorganic, over two (2) inches in any dimension. Remove debris from site.
  - 2. After raking, apply lime and fertilizer over entire area.
  - 3. Cross disc to a minimum of three (3) inch depth.
  - 4. Again rake area, removing debris over one (1) inch in any dimension. Remove debris from site.
  - 5. Finish grading smooth, true, free from debris, humps, depression, etc. Finish swales correct and true and ready for seeding. Maximum tolerance shall be 0.1 foot.

### **3.02 SEEDING**

- A. Seed at rate of five (5) pounds per 1000 sq. ft. or as indicated on Landscaping Plans.
- B. Uniformly distribute seed with a mechanical spreader. Sow half of seed in one (1) direction and balance at right angles. If so directed, accomplish additional firming by light-rollers.
- C. No seeding to be done during windy weather, or when ground is wet or otherwise non-tillable.
- D. Seed between September 1 and November 15 or between March 1 and May 1, unless otherwise approved in writing by Architect.

### **3.03 WATERING**

- A. Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

B. Schedule watering to prevent wilting, browning, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

C. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

**END OF SECTION**

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