

PROJECT MANUAL

HORRY GEORGETOWN TECHNICAL COLLEGE

PROJECT # H59-N269-CB HGTC BLDG 500 EXTERIOR CANOPY SHELTER



Prepared for

HORRY GEORGETOWN TECHNICAL COLLEGE
4003 SOUTH FRASER STREET
GEORGETOWN, SOUTH CAROLINA 29440

Prepared by



The EARTHWORKS Group, Inc.
11665 HIGHWAY 707
MURRELLS INLET, SC 29576

MAY 2024

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SE-310 INVITATION FOR DESIGN-BID-BUILD CONSTRUCTION SERVICES

AGENCY: HGTC - Horry-Georgetown Technical College

PROJECT NAME: HGTC - GT Bldg. 500 Exterior Renovation

PROJECT NUMBER: H59-N269-CB CONSTRUCTION COST RANGE: \$300,000 to \$400,000

PROJECT LOCATION: Georgetown, SC

DESCRIPTION OF PROJECT/SERVICES: *(450 character limit)*

Addition to Georgetown Bldg. 500 a 30 x 40 roof canopy and installation of 18 ft roll up door and move 3 x 7 personnel door to another location. Existing loading dock equipment will be removed, and the loading dock floor perforated and backfilled to allow a new exterior concrete slab to fill in the loading dock well.

BID/SUBMITTAL DUE DATE: 07/02/2024 TIME: 10:00 AM NUMBER OF COPIES: 1

PROJECT DELIVERY METHOD: Design-Bid-Build

AGENCY PROJECT COORDINATOR: Kevin Brown

EMAIL: kevin.brown@hgtc.edu TELEPHONE: (843) 349-5354

DOCUMENTS OBTAINED FROM: https://hgtc.edu/purchasing

BID SECURITY IS REQUIRED IN AN AMOUNT NOT LESS THAN 5% OF THE BASE BID.

PERFORMANCE AND LABOR & MATERIAL PAYMENT BONDS: The successful Contractor will be required to provide Performance and Labor and Material Payment Bonds, each in the amount of 100% of the Contract Price.

DOCUMENT DEPOSIT AMOUNT: \$0.00 IS DEPOSIT REFUNDABLE: Yes No N/A

Bidders must obtain Bidding Documents/Plans from the above listed source(s) to be listed as an official plan holder. Bidders that rely on copies obtained from any other source do so at their own risk. All written communications with official plan holders & bidders will be via email or website posting.

Agency **WILL NOT** accept Bids sent via email.

All questions & correspondence concerning this Invitation shall be addressed to the A/E.

A/E NAME: Earthworks Group, Inc. A/E CONTACT: Steven G. Strickland

EMAIL: sstrickland@earthworksgroup.com TELEPHONE: (843) 651-7903

PRE-BID CONFERENCE: Yes No MANDATORY ATTENDANCE: Yes No

PRE-BID DATE: 06/18/2024 TIME: 02:00 PM

PRE-BID PLACE: HGTC, 4003 South Fraser Street, Georgetown, SC 29440, Building 500

BID OPENING PLACE: HGTC, 2050 Hwy 501 E., Conway, SC 29526 Bldg. 100, Room 122

BID DELIVERY ADDRESSES:

HAND-DELIVERY:

Attn: Dianna Cecala, Procurement

HGTC 2050 Hwy 501 E.

Conway, SC 29526 Bldg. 100, Room 120

MAIL SERVICE:

Attn: Dianna Cecala, Procurement

HGTC 2050 Hwy 501 E

Conway, SC 29526, 100 Room 120

IS PROJECT WITHIN AGENCY CONSTRUCTION CERTIFICATION? Yes No

APPROVED BY:



DATE: 06/03/2024

(OSE PROJECT MANAGER)

AIA DOCUMENT A701

INSERT HERE

AFTER AWARD

SE-330 LUMP SUM BID FORM

Bidders shall submit bids on only Bid Form SE-330.

BID SUBMITTED BY: _____
(Bidder's Name)

BID SUBMITTED TO: HORRY-GEORGETOWN TECHNICAL COLLEGE
(Owner's Name)

FOR: PROJECT NAME: HGTC - GT BLDG. 500 EXTERIOR RENOVATION
PROJECT NUMBER: H59-N269-CB

OFFER

- § 1. In response to the Invitation for Construction Services and in compliance with the Instructions to Bidders for the above-named Project, the undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with the Owner on the terms included in the Bidding Documents, and to perform all Work as specified or indicated in the Bidding Documents, for the prices and within the time frames indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- § 2. Pursuant to Section 11-35-3030(1) of the SC Code of Laws, as amended, Bidder has submitted Bid Security as follows in the amount and form required by the Bidding Documents:
- Bid Bond with Power of Attorney
 Electronic Bid Bond
 Cashier's Check
(Bidder check one)
- § 3. Bidder acknowledges the receipt of the following Addenda to the Bidding Documents and has incorporated the effects of said Addenda into this Bid:
(Bidder, check all that apply. Note, there may be more boxes than actual addenda. Do not check boxes that do not apply)
- ADDENDA:** #1 #2 #3 #4 #5
- § 4. Bidder accepts all terms and conditions of the Invitation for Bids, including, without limitation, those dealing with the disposition of Bid Security. Bidder agrees that this Bid, including all Bid Alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of **60** Days following the Bid Date, or for such longer period of time that Bidder may agree to in writing upon request of the Owner.
- § 5. Bidder herewith offers to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fees, permits, licenses and applicable taxes necessary to complete the following items of construction work:
- § 6.1 **BASE BID WORK** *(as indicated in the Bidding Documents and generally described as follows):* THE PROJECT IS BASICALLY A 30' X 40' OPEN SIDED METAL BUILDING CANOPY STRUCTURE WITH CONCRETE SLAB BASE FOR OUTDOOR INSTRUCTION AND WORKSPACE. SITE WORK TO INCLUDE IS INFILL AND CAPPING OF ADJACENT LOADING DOCK. MINOR ALTERATIONS TO EXISTING BUILDING SUCH AS NEW ROLL UP DOOR AND RELOCATION OF EXISTING EXHUAST FAN / VENT.

\$ _____, which sum is hereafter called the Base Bid.
(Bidder to insert Base Bid Amount on line above)

SE-330
LUMP SUM BID FORM

§ 6.2 **BID ALTERNATES** as indicated in the Bidding Documents and generally described as follows:

ALTERNATE # 1 (Brief Description): _____

ADD TO or **DEDUCT FROM BASE BID: \$** _____

(Bidder to mark appropriate box to clearly indicate the price adjustment offered for each Alternate)

ALTERNATE # 2 (Brief Description): _____

ADD TO or **DEDUCT FROM BASE BID: \$** _____

(Bidder to mark appropriate box to clearly indicate the price adjustment offered for each Alternate)

ALTERNATE # 3 (Brief Description): _____

ADD TO or **DEDUCT FROM BASE BID: \$** _____

(Bidder to mark appropriate box to clearly indicate the price adjustment offered for each Alternate)

§ 6.3 **UNIT PRICES:**

BIDDER offers for the Agency’s consideration and use, the following **UNIT PRICES**. The **UNIT PRICES** offered by **BIDDER** indicate the amount to be added to or deducted from the **CONTRACT SUM** for each item-unit combination. **UNIT PRICES** include all costs to the Agency, including those for materials, labor, equipment, tools of trades and labor, fees, taxes, insurance, bonding, overhead, profit, etc. The Agency reserves the right to include or not to include any of the following **UNIT PRICES** in the Contract and to negotiate the **UNIT PRICES** with **BIDDER**.

No.	ITEM	UNIT OF MEASURE	ADD	DEDUCT
1.	_____	_____	\$ _____	\$ _____
2.	_____	_____	\$ _____	\$ _____
3.	_____	_____	\$ _____	\$ _____
4.	_____	_____	\$ _____	\$ _____
5.	_____	_____	\$ _____	\$ _____
6.	_____	_____	\$ _____	\$ _____

**SE-330
LUMP SUM BID FORM**

§ 7. LISTING OF PROPOSED SUBCONTRACTORS PURSUANT TO SECTION 3020(b)(i), CHAPTER 35, TITLE 11 OF THE SOUTH CAROLINA CODE OF LAWS, AS AMENDED
(See Instructions on the following page BF-2A)

Bidder shall use the below-listed Subcontractors in the performance of the Subcontractor Classification work listed:

SUBCONTRACTOR CLASSIFICATION By License Classification and/or Subclassification <i>(Completed by Owner)</i>	SUBCONTRACTOR'S PRIME CONTRACTOR'S NAME <i>(Must be completed by Bidder)</i>	SUBCONTRACTOR'S PRIME CONTRACTOR'S SC LICENSE NUMBER <i>(Requested, but not Required)</i>
BASE BID		
ALTERNATE #1		
ALTERNATE #2		
ALTERNATE #3		

If a Bid Alternate is accepted, Subcontractors listed for the Bid Alternate shall be used for the work of both the Alternate and the Base Bid work.

SE-330 LUMP SUM BID FORM

INSTRUCTIONS FOR SUBCONTRACTOR LISTING

1. Section 7 of the Bid Form sets forth an Owner developed list of contractor/subcontractor specialties by contractor license category and/or subcategory for which bidder is required to identify the entity (subcontractor(s) and/or himself) Bidder will use to perform the work of each listed specialty..
 - a. **Column A:** The Owner fills out this column, which identifies the contractor/subcontractor specialties for which the bidder must list either a subcontractor or himself as the entity that will perform this work. Subcontractor specialties are identified by contractor license categories or subcategories listed in Title 40 of the South Carolina Code of laws. Abbreviations of classifications to be listed after the specialty can be found at: <http://www.llr.state.sc.us/POL/Contractors/PDFFiles/CLBCClassificationAbbreviations.pdf> . If the owner has not identified a specialty, the bidder does not list a subcontractor.
 - b. **Columns B and C:** In these columns, the Bidder identifies the subcontractors it will use for the work of each specialty listed by the Owner in Column A. Bidder must identify only the subcontractor(s) who will perform the work and no others. Bidders should make sure that their identification of each subcontractor is clear and unambiguous. A listing that could be any number of different entities may be cause for rejection of the bid as non-responsive. For example, a listing of M&M without more may be problematic if there are multiple different licensed contractors in South Carolina whose names start with M&M.
2. **Subcontractor Defined:** For purposes of subcontractor listing, a subcontractor is an entity who will perform work or render service to the prime contractor to or about the construction site pursuant to a contract with the prime contractor. Bidder should not identify sub-subcontractors in the spaces provided on the bid form but only those entities with which bidder will contract directly. Likewise, do not identify material suppliers, manufacturers, and fabricators that will not perform physical work at the site of the project but will only supply materials or equipment to the bidder or proposed subcontractor(s).
3. **Subcontractor Qualifications:** Bidder must only list subcontractors who possess a South Carolina Contractor's license with the license classification and/or subclassification identified by the Owner in the first column on the left. The subcontractor license must also be within the appropriate license group for the work of the specialty. If Bidder lists a subcontractor who is not qualified to perform the work, the Bidder will be rejected as non-responsive.
4. **Use of Own forces:** If under the terms of the Bidding Documents, Bidder is qualified to perform the work of a listed specialty and Bidder does not intend to subcontract such work but to use Bidder's own employees to perform such work, the Bidder must insert its own name in the space provided for that specialty.
5. **Use of Multiple Subcontractors:**
 - a. If Bidder intends to use multiple subcontractors to perform the work of a single specialty listing, Bidder must insert the name of each subcontractor Bidder will use, preferably separating the name of each by the word **"and"**. If Bidder intends to use both his own employees to perform a part of the work of a single specialty listing and to use one or more subcontractors to perform the remaining work for that specialty listing, bidder must insert his own name and the name of each subcontractor, preferably separating the name of each with the word **"and"**. Bidder must use each entity listed for the work of a single specialty listing in the performance of that work.
 - b. **Optional Listing Prohibited:** Bidder may not list multiple subcontractors for a specialty listing, in a form that provides the Bidder the option, after bid opening or award, to choose to use one or more but not all the listed subcontractors to perform the work for which they are listed. A listing, which on its face requires subsequent explanation to determine whether it is an optional listing, is non-responsive. If bidder intends to use multiple entities to perform the work for a single specialty listing, bidder must clearly set forth on the bid form such intent. Bidder may accomplish this by simply inserting the word **"and"** between the names of each entity listed for that specialty. Agency will reject as non-responsive a listing that contains the names of multiple subcontractors separated by a blank space, the word "or", a virgule (that is a /), or any separator that the Agency may reasonably interpret as an optional listing.
6. If Bidder is awarded the contract, bidder must, except with the approval of the Agency for good cause shown, use the listed entities to perform the work for which they are listed.
7. If bidder is awarded the contract, bidder will not be allowed to substitute another entity as subcontractor in place of a subcontractor listed in Section 7 of the Bid except for one or more of the reasons allowed by the SC Code of Laws.
8. Bidder's failure to identify an entity (subcontractor or himself) to perform the work of a subcontractor specialty listed in the first column on the left will render the Bid non-responsive.

SE-330 LUMP SUM BID FORM

§ 8. LIST OF MANUFACTURERS, MATERIAL SUPPLIERS, AND SUBCONTRACTORS OTHER THAN SUBCONTRACTORS LISTED IN SECTION 7 ABOVE (*FOR INFORMATION ONLY*):

Pursuant to instructions in the Invitation for Construction Services, if any, Bidder will provide to Owner upon the Owner's request and within 24 hours of such request, a listing of manufacturers, material suppliers, and subcontractors, other than those listed in Section 7 above, that Bidder intends to use on the project. Bidder acknowledges and agrees that this list is provided for purposes of determining responsibility and not pursuant to the subcontractor listing requirements of SC Code Ann § 11-35-3020(b)(i).

§ 9. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES

a) CONTRACT TIME

Bidder agrees that the Date of Commencement of the Work shall be established in a Notice to Proceed to be issued by the Owner. Bidder agrees to substantially complete the Work within 120 Calendar Days from the Date of Commencement, subject to adjustments as provided in the Contract Documents.

b) LIQUIDATED DAMAGES

Bidder further agrees that from the compensation to be paid, the Owner shall retain as Liquidated Damages the amount of \$ 200.00 for each Calendar Day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. This amount is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty for nonperformance.

§ 10. AGREEMENTS

- a) Bidder agrees that this bid is subject to the requirements of the laws of the State of South Carolina.
- b) Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the State.
- c) Bidder agrees that neither the State of South Carolina nor any of its agencies, employees or agents shall be responsible for any bid preparation costs, or any costs or charges of any type, should all bids be rejected or the Project canceled for any reason prior to the issuance of the Notice to Proceed.

§ 11. ELECTRONIC BID BOND

By signing below, the Principal is affirming that the identified electronic bid bond has been executed and that the Principal and Surety are firmly bound unto the State of South Carolina under the terms and conditions of the AIA Document A310, Bid Bond, included in the Bidding Documents.

ELECTRONIC BID BOND NUMBER: _____

SIGNATURE AND TITLE: _____

**SE-330
LUMP SUM BID FORM**

CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATION

SC Contractor's License Number(s): _____

Classification(s) & Limits: _____

Subclassification(s) & Limits: _____

By signing this Bid, the person signing reaffirms all representation and certification made by both the person signing and the Bidder, including without limitation, those appearing in Article 2 of the Instructions to Bidders, is expressly incorporated by reference.

BIDDER'S LEGAL NAME: _____

ADDRESS: _____

TELEPHONE: _____

EMAIL: _____

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____

TITLE: _____

AIA DOCUMENT A101
INSERT HERE
AFTER AWARD

AIA DOCUMENT A201

INSERT HERE

AFTER AWARD

SE-355
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that *(Insert full name or legal title and address of Contractor)*

Name: _____
Address: _____

hereinafter referred to as “Contractor”, and *(Insert full name and address of principal place of business of Surety)*

Name: _____
Address: _____

hereinafter called the “surety”, are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: _____
Address: _____

hereinafter referred to as “Agency”, or its successors or assigns, the sum of _____ (\$ _____), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____ entered into a contract with Agency to construct

State Project Name: _____
State Project Number: _____
Brief Description of Awarded Work, as found on the SE-330 or SE-332, Bid Form: _____

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: _____
Address: _____

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

IN WITNESS WHEREOF, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

DATED this _____ **day of** _____, **2** _____
(shall be no earlier than Date of Contract)

BOND NUMBER _____

CONTRACTOR

By: _____
(Seal)

Print Name: _____

Print Title: _____

Witness: _____

SURETY

By: _____
(Seal)

Print Name: _____

Print Title: _____
(Attach Power of Attorney)

Witness: _____

(Additional Signatures, if any, appear on attached page)

SE-355**PERFORMANCE BOND****NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency for the full and faithful performance of the contract, which is incorporated herein by reference.
2. If the Contractor performs the contract, the Surety and the Contractor have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.
3. The Surety's obligation under this Bond shall arise after:
 - 3.1 The Agency has notified the Contractor and the Surety at the address described in paragraph 10 below, that the Agency is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If the Agency, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the Agency's right, if any, subsequently to declare a Contractor Default; or
 - 3.2 The Agency has declared a Contractor Default and formally terminated the Contractor's right to complete the Contract.
4. The Surety shall, within 15 days after receipt of notice of the Agency's declaration of a Contractor Default, and at the Surety's sole expense, take one of the following actions:
 - 4.1 Arrange for the Contractor, with consent of the Agency, to perform and complete the Contract; or
 - 4.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Agency for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Agency and the contractor selected with the Agency's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the Agency the amount of damages as described in paragraph 7 in excess of the Balance of the Contract Sum incurred by the Agency resulting from the Contractor Default; or
 - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and:
 - 4.4.1 After investigation, determine the amount for which it may be liable to the Agency and, within 60 days of waiving its rights under this paragraph, tender payment thereof to the Agency; or
 - 4.4.2 Deny liability in whole or in part and notify the Agency, citing the reasons therefore.
5. Provided Surety has proceeded under paragraphs 4.1, 4.2, or 4.3, the Agency shall pay the Balance of the Contract Sum to either:
 - 5.1 Surety in accordance with the terms of the Contract; or
 - 5.2 Another contractor selected pursuant to paragraph 4.3 to perform the Contract.
 - 5.3 The balance of the Contract Sum due either the Surety or another contractor shall be reduced by the amount of damages as described in paragraph 7.
6. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond 15 days after receipt of written notice from the Agency to the Surety demanding that the Surety perform its obligations under this Bond, and the Agency shall be entitled to enforce any remedy available to the Agency.
 - 6.1 If the Surety proceeds as provided in paragraph 4.4 and the Agency refuses the payment tendered or the Surety has denied liability, in whole or in part, then without further notice the Agency shall be entitled to enforce any remedy available to the Agency.
 - 6.2 Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the Dispute Resolution process defined in the Contract Documents and the laws of the State of South Carolina.
 7. After the Agency has terminated the Contractor's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Agency shall be those of the Contractor under the Contract, and the responsibilities of the Agency to the Surety shall those of the Agency under the Contract. To a limit of the amount of this Bond, but subject to commitment by the Agency of the Balance of the Contract Sum to mitigation of costs and damages on the Contract, the Surety is obligated to the Agency without duplication for:
 - 7.1 The responsibilities of the Contractor for correction of defective Work and completion of the Contract; and
 - 7.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and
 - 7.3 Damages awarded pursuant to the Dispute Resolution Provisions of the Contract. Surety may join in any Dispute Resolution proceeding brought under the Contract and shall be bound by the results thereof; and
 - 7.4 Liquidated Damages, or if no Liquidated Damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.
 8. The Surety shall not be liable to the Agency or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Sum shall not be reduced or set-off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Agency or its heirs, executors, administrators, or successors.
 9. The Surety hereby waives notice of any change, including changes of time, to the contract or to related subcontracts, purchase orders and other obligations.
 10. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the address shown on the signature page.
 11. Definitions
 - 11.1 Balance of the Contract Sum: The total amount payable by the Agency to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts to be received by the Agency in settlement of insurance or other Claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.
 - 11.2 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform the Contract or otherwise to comply with the terms of the Contract.

SE-357

LABOR & MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that *(Insert full name or legal title and address of Contractor)*

Name: _____
Address: _____

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: _____
Address: _____

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: _____
Address: _____

hereinafter referred to as "Agency", or its successors or assigns, the sum of _____ (\$ _____), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____ entered into a contract with Agency to construct

State Project Name: _____
State Project Number: _____
Brief Description of Awarded Work, as found on the SE-330 or SE-332, Bid Form: _____

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: _____
Address: _____

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

IN WITNESS WHEREOF, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Labor & Material Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

DATED this _____ day of _____, 20____
(shall be no earlier than Date of Contract)

BOND NUMBER _____

CONTRACTOR

SURETY

By: _____
(Seal)

By: _____
(Seal)

Print Name: _____

Print Name: _____

Print Title: _____

Print Title: _____
(Attach Power of Attorney)

Witness: _____

Witness: _____

(Additional Signatures, if any, appear on attached page)

SE-357**LABOR & MATERIAL PAYMENT BOND****NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency to pay for all labor, materials and equipment required for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to the Agency, this obligation shall be null and void if the Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants; and
 - 2.2 Defends, indemnifies and holds harmless the Agency from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. With respect to Claimants, and subject to the provisions of Title 29, Chapter 5 and the provisions of §11-35-3030(2)(c) of the SC Code of Laws, as amended, the Surety's obligation under this Bond shall arise as follows:
 - 4.1 Every person who has furnished labor, material or rental equipment to the Contractor or its subcontractors for the work specified in the Contract, and who has not been paid in full therefore before the expiration of a period of ninety (90) days after the date on which the last of the labor was done or performed by him or material or rental equipment was furnished or supplied by him for which such claim is made, shall have the right to sue on the payment bond for the amount, or the balance thereof, unpaid at the time of institution of such suit and to prosecute such action for the sum or sums justly due him.
 - 4.2 A remote claimant shall have a right of action on the payment bond upon giving written notice by certified or registered mail to the Contractor within ninety (90) days from the date on which such person did or performed the last of the labor or furnished or supplied the last of the material or rental equipment upon which such claim is made.
 - 4.3 Every suit instituted upon a payment bond shall be brought in a court of competent jurisdiction for the county or circuit in which the construction contract was to be performed, but no such suit shall be commenced after the expiration of one year after the day on which the last of the labor was performed or material or rental equipment was supplied by the person bringing suit.
5. When the Claimant has satisfied the conditions of paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
 - 5.1 Send an answer to the Claimant, with a copy to the Agency, within sixty (60) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 5.2 Pay or arrange for payment of any undisputed amounts.
 - 5.3 The Surety's failure to discharge its obligations under this paragraph 5 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a claim. However, if the Surety fails to discharge its obligations under this paragraph 5, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs to recover any sums found to be due and owing to the Claimant.
6. Amounts owed by the Agency to the Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the Contractor furnishing and the Agency accepting this Bond, they agree that all funds earned by the contractor in the performance of the Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Agency's prior right to use the funds for the completion of the Work.
7. The Surety shall not be liable to the Agency, Claimants or others for obligations of the Contractor that are unrelated to the Contract. The Agency shall not be liable for payment of any costs or expenses of any claimant under this bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.
9. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, the Agency or the contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
10. By the Contractor furnishing and the Agency accepting this Bond, they agree that this Bond has been furnished to comply with the statutory requirements of the South Carolina Code of Laws, as amended, and further, that any provision in this Bond conflicting with said statutory requirements shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.
11. Upon request of any person or entity appearing to be a potential beneficiary of this bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
12. Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the laws of the State of South Carolina.

13. DEFINITIONS

- 13.1 Claimant: An individual or entity having a direct contract with the Contractor or with a Subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien might otherwise be asserted.
- 13.2 Remote Claimant: A person having a direct contractual relationship with a subcontractor of the Contractor or subcontractor, but no contractual relationship expressed or implied with the Contractor.
- 13.3 Contract: The agreement between the Agency and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

SE-380

CHANGE ORDER NO.: _____

CHANGE ORDER TO CONSTRUCTION CONTRACT

AGENCY: _____

PROJECT NAME: _____

PROJECT NUMBER: _____

CONTRACTOR: _____ CONTRACT DATE: _____

This Contract is changed as follows: *(Insert description of change in space provided below)*

ADJUSTMENTS IN THE CONTRACT SUM:

1. Original Contract Sum:		\$
2. Change in Contract Sum by previously approved Change Orders:		
3. Contract Sum prior to this Change Order		\$ 0.00
4. Amount of this Change Order:		
5. New Contract Sum, including this Change Order:		\$ 0.00

ADJUSTMENTS IN THE CONTRACT TIME:

1. Original Substantial Completion Date:		
2. Sum of previously approved increases and decreases in Days:		Days
3. Change in Days for this Change Order		Days
4. New Substantial Completion Date:		

CONTRACTOR ACCEPTANCE:

BY: _____ Date: _____
(Signature of Representative)

Print Name: _____

A/E RECOMMENDATION FOR ACCEPTANCE:

BY: _____ Date: _____
(Signature of Representative)

Print Name: _____

AGENCY ACCEPTANCE AND CERTIFICATION:

BY: _____ Date: _____
(Signature of Representative)

Print Name: _____

Change is within Agency Construction Contract Change Order Certification of: \$ _____ Yes No

Office of the State Engineer Authorization for change exceeding Agency Construction Contract Change Order Certification:

AUTHORIZED BY: _____ DATE: _____
(OSE Project Manager)

SUBMIT THE FOLLOWING TO OSE

1. SE-380, fully completed and signed by the Contractor, A/E and Agency;
2. Detailed back-up information from the Contractor/Subcontractor(s) that justifies the costs and schedule changes shown.
3. If any item exceeds Agency certification, OSE will authorize the SE-380 and return to Agency.

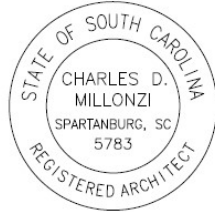
TECHNICAL SPECIFICATIONS

DOCUMENT 000107 - SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

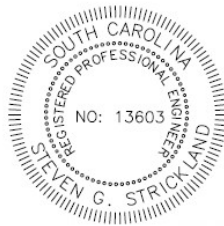
A. Architect:

1. Charles D. Millonzi, RA
2. SC # 5783.
3. Responsible for Architectural drawings.



B. Structural Engineer:

1. Steven G. Strickland.
2. SC # 13603.
3. Responsible for Structural drawings.



C. MEP Engineer:

1. Christopher J. Hammel.
2. SC # 27391.
3. Responsible for Mechanical drawings.



END OF DOCUMENT 000107

DOCUMENT 000115 - LIST OF DRAWING SHEETS**1.1 LIST OF DRAWINGS**

- A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the Table of Contents page of the separately bound drawing set titled Horry Georgetown Technical College Bldg. 500 Exterior Canopy Shelter, dated 05/08/2024, as modified by subsequent Addenda and Contract modifications.
- B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:
1. G1.01 PROJECT COVERSHEET
 2. G1.02 SPECIAL INSPECTIONS
 3. G1.03 LIFE SAFETY PLAN / CODE REVIEW
 4. C1.01 EXISTING CONDITIONS
 5. C1.02 DEMOLITION PLAN
 6. C1.03 PROPOSED CONDITIONS
 7. A1.01 EXISTING FLOOR PLAN
 8. A1.02 PROPOSED FLOOR PLAN
 9. A1.03 PROPOSED FOUNDATION PLAN
 10. A1.04 PROPOSED ROOF PLAN
 11. A2.01 EXISTING EXTERIOR ELEVATIONS
 12. A2.02 PROPOSED EXTERIOR ELEVATIONS
 13. A3.01 BUILDING SECTIONS
 14. A3.02 BUILDING SECTIONS
 15. A6.01 DOOR SCHEDULE & DETAILS
 16. P1.01 PLUMBING PLAN
 17. E1.01 ELECTRICAL PLAN
 18. S1.01 FOUNDATION PLAN
 19. S2.01 STRUCTURAL DETAILS
 20. S3.01 STRUCTURAL NOTES

END OF DOCUMENT 000115

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 PROJECT INFORMATION

- A. Project Identification: South Carolina Project Number H59-N269-CB HGTC BLDG. 500 Exterior Canopy Shelter.
 - 1. Project Location: 4003 South Fraser Street Georgetown, SC 29440.
- B. Owner: Horry Georgetown Technical College, State of South Carolina.
- C. Architect: Charles Millonzi.
- D. Architect's Consultants: Architect has retained the following design professionals who have prepared designated portions of the Contract Documents: N/A
- E. Copy and re-edit subparagraph below for each consultant. Coordinate with requirement in Section 012000 "Price and Payment Procedures" to arrange schedule of values data by design consultant contracts for purposes of delineating the scopes of multiple certifications of payments.
- F. Contractor: TBD – Design Bid Build
- G. Retain "Project Website" Paragraph below if Project uses a project website, project extranet, or FTP site for information and document management.
- H. The Work consists of Addition of metal canopy structure for additional workspace, concrete slab, infill of existing loading dock, exterior renovations as necessary.
- I. Work by Owner: N/A.
- J. Work Under Separate Contracts: N/A.
- K. In a list below, include items of work shown on Drawings but not included in the Contract, and any other work that will be performed at the same time as construction or that may require coordination with construction. Copy and re-edit subparagraph for each separate contract. See Evaluations. N/A
- L. Owner-Furnished Products: The following products will be furnished by Owner and shall be installed by Contractor as part of the Work: N/A

1.2 WORK RESTRICTIONS

- A. Contractor's Use of Premises: During construction, Contractor will have limited use of site and building indicated. Contractor's use of premises is limited only by Owner's right to perform work or employ other contractors on portions of Project.
 - 1. Owner will occupy premises during construction. Perform construction only during normal working hours 8 AM to 5 PM Monday thru Friday, other than holidays, unless otherwise

- agreed to in advance by Owner. Clean up work areas and return to usable condition at the end of each work period.
2. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 40 feet (12.2 m) beyond building perimeter; 10 feet (3 m) beyond surface walkways, patios, surface parking, and utilities less than 12 inches (300 mm) in diameter; 15 feet (4.5 m) beyond primary roadway curbs and main utility branch trenches; and 25 feet (7.6 m) beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas to limit compaction in the constructed area.
 3. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 40 feet (12.2 m) beyond building perimeter; 15 feet (4.6 m) beyond surface walkways, patios, surface parking, and utilities; and 25 feet (7.6 m) beyond constructed areas with permeable surfaces that require additional staging areas to limit compaction in the constructed areas.
 4. Driveways, Walkways, and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 7 p.m., Monday through Friday, unless otherwise indicated.
1. Weekend Hours: As needed and approved by owner.
 2. Early Morning Hours: As needed and approved by owner.
- C. Nonsmoking Building: Smoking is not permitted on the campus.

END OF SECTION 011000

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Items indicated to be removed and salvaged remain Owner's property. Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.
- B. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements. Submit before Work begins.
- C. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- D. It is not expected that hazardous materials will be encountered in the Work. If hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with EPA regulations and with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Maintain services/systems indicated to remain and protect them against damage during selective demolition operations. Before proceeding with demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of the building.
- B. Locate, identify, shut off, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.
- D. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

- E. Protect walls, ceilings, floors, and other existing finish work that are to remain. Erect and maintain dustproof partitions. Cover and protect furniture, furnishings, and equipment that have not been removed.
- F. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- G. Provide temporary weather protection to prevent water leakage and damage to structure and interior areas.
- H. Requirements for Building Reuse:
 - 1. Maintain existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and nonstructural roofing material) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.
 - 2. Maintain existing interior nonstructural elements (interior walls, doors, floor coverings, and ceiling systems) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.
- I. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- J. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill. Do not burn demolished materials.
- K. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Concrete Mix Designs, and submittals required by ACI 301.
- B. Submittals: Reinforcing Product Data, Concrete Reinforcing Shop Drawings, Concrete Joint Layout.
- C. Ready-Mixed Concrete Producer Qualifications: ASTM C 94/C 94M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ACI 301, "Specification for Structural Concrete," and with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

2.2 MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain Steel Wire: ASTM A 82/A 82M, as drawn.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, as drawn, flat sheet.
- D. Portland Cement: ASTM C 150, Type I or II.
- E. Fly Ash: ASTM C 618, Class C or F.
- F. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- G. Silica Fume: ASTM C 1240, amorphous silica.
- H. Aggregates: ASTM C 33, Class 4S coarse aggregate or better, graded, with at least 10 years' satisfactory service in similar applications. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1-1/2 inches (38 mm) nominal.
 - 2. Maximum Aggregate Size for Concrete in Insulating Concrete Forms: 3/4 inch (19 mm).
- I. Air-Entraining Admixture: ASTM C 260/C2602M.
- J. Chemical Admixtures: ASTM C 494, Water Reducing ASTM C494/C494M, Type A, High-Range Water Reducing ASTM C494/C494M, Type F, Water Reducing and Retarding ASTM C494/C494M Type D, and Water Reducing and Retarding ASTM C494/C494m Type G. Do not use calcium chloride or admixtures containing calcium chloride.

- K. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures.
- L. Synthetic Fiber: ASTM C 1116/C 1116M, Type III, polypropylene fibers, 1/2 to 1-1/2 inches (13 to 38 mm) long.
- M. Vapor Retarder: Reinforced sheet, ASTM E 1745, Class A: not less than 10 mils (0.25 mm) thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.
- N. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.
- O. Penetrating Stain: Water-based, acrylic latex, penetrating stain with colorfast pigments.
- P. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- Q. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- R. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- S. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- T. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.3 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301.
- B. Normal-Weight Concrete Class A concrete used for all foundations, and slabs:
 - 1. Minimum Compressive Strength: 4500 psi (27.6 MPa) at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45
 - 3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
 - 4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of floor slabs to receive troweled finishes to exceed 3 percent.
 - 5. Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
 - 6. For concrete exposed to deicing chemicals, limit use of fly ash to 25 percent replacement of portland cement by weight and granulated blast-furnace slag to 40 percent of portland cement by weight; silica fume to 10 percent of portland cement by weight.
 - 7. Exposure Class: ACI 318 (ACI 318M) F2, S0, W1, C1.
- C. Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116.
 - 1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 CONCRETING

- A. Construct formwork according to ACI 301 and maintain tolerances and surface irregularities within ACI 347R limits of Class A, 1/8 inch (3.2 mm) for concrete exposed to view and Class B, 1/4 inch (6 mm) for other concrete surfaces.
- B. Place vapor retarder on prepared subgrade, with joints lapped 6 inches (150 mm) and sealed.
- C. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- D. Install construction, isolation, and contraction joints where indicated. Install full-depth joint-filler strips at isolation joints.
- E. Installation of 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. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
- F. Place concrete in a continuous operation and consolidate using mechanical vibrating equipment.
- G. Protect concrete from physical damage, premature drying, and reduced strength due to hot or cold weather during mixing, placing, and curing.
- H. Formed Surface Finish: Smooth-formed finish for concrete exposed to view, coated, or covered by waterproofing or other direct-applied material; rough-formed finish elsewhere.
- I. Slab Finishes: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces. Provide the following finishes:
 - 1. Scratch finish for surfaces to receive mortar setting beds.
 - 2. Float finish for surfaces to receive waterproofing, roofing, or other direct-applied material.
 - 3. Troweled finish for floor surfaces and floors to receive floor coverings, paint, or other thin film-finish coatings.
 - 4. Trowel and fine-broom finish for surfaces to receive thin-set tile.
 - 5. Nonslip-broom finish to exterior concrete platforms, steps, and ramps.
- J. Cure formed surfaces by moisture curing for at least seven days.
- K. Begin curing concrete slabs after finishing. Keep concrete continuously moist for at least seven days Apply membrane-forming curing compound to concrete Apply membrane-forming curing and sealing compound to concrete.
- L. Polished Concrete Floor Treatment: Apply polished concrete finish system to cured and prepared slabs to Level 2, low sheen, 400 grit and match design reference sample.
 - 1. Machine grind floor surfaces level and smooth to depth required to not reveal aggregate.
 - 2. Apply penetrating liquid floor treatment according to manufacturer's written instructions.

3. Apply neutral gray penetrating stain for polished concrete in polishing sequence and according to manufacturer's written instructions.
 4. Continue polishing with progressively finer polishing pads to gloss level required.
 5. Neutralize and clean polished floor surfaces.
- M. Owner will engage a testing agency to perform field tests and to submit test reports.
- N. Protect concrete from damage. Repair and patch defective areas.

END OF SECTION 033000

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product data, Statement of recycled content, Shop Drawings, Welding Procedure Specifications (WPSs), and mill test reports.
- B. Comply with applicable provisions of the following:
 - 1. AISC 303.
 - 2. AISC 341 and AISC 341s1.
 - 3. AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator.
 - 1. Use LRFD; data are given at factored-load level

2.2 STRUCTURAL STEEL

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [25] percent.
- B. W-Shapes: ASTM A 992/A 992M ASTM A 572/A 572M, Grade 50 (345).
- C. Channels, Angles, M, S -Shapes: ASTM A 36/A 36M ASTM A 572/A 572M, Grade 50 (345).
- D. Plate and Bar: ASTM A 36/A 36M ASTM A 572/A 572M, Grade 50 (345).
- E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade C, structural tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.

2.3 ACCESSORIES

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.
- B. Anchor Rods: ASTM F 1554, Grade 36.

1. Configuration: Straight.
 2. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
- C. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- D. Grout: ASTM C 1107, nonmetallic, shrinkage resistant, factory packaged.

2.4 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303 and AISC 360.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- C. Shop Priming: Prepare surfaces according to SSPC-SP 2 or SSPC-SP 3. Shop prime steel to a dry film thickness of at least 1.5 mils (0.038 mm). Do not prime surfaces to be embedded in concrete or mortar or to be field welded.

PART 3 - EXECUTION

3.1 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates: Clean concrete and masonry surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of base plate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure.
- C. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- D. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- E. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.
- F. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

END OF SECTION 051200

SECTION 074113 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Summary: Factory-formed metal roof panels, fascia, and trim.
- B. Submittals: Product Data, Shop Drawings, and Color Samples for all components.
- C. Warranties: Manufacturer's standard written warranty, signed by manufacturer agreeing to promptly repair or replace products that fail to remain weathertight for the period of 10-20 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Energy Performance of Roof Panels: Three-year, aged, solar reflectance not less than 0.55 and emissivity not less than 0.75, or aged, Solar Reflectance Index of not less than 64.
- B. Solar Reflectance Index: Not less than 78/29 when calculated according to ASTM E 1980.
- C. Wind-Uplift Resistance of Roof Assemblies: UL 580, UL 90.

2.2 METAL ROOF PANELS

- A. Roof Panel Type: concealed-fastener, lap-seam or standing-seam metal roof panels.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advanced Building Products Inc.
 - b. AEP Span a brand of ASC Profiles LLC, a part of BlueScope
 - c. ATAS International, Inc.
 - d. Berridge Manufacturing Company
 - e. CENTRIA, a Nucor Brand
 - f. MBCI; Conerstone Building Brands
 - g. Morin – A Kingspan Group Company
 - h. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle Company

- B. Metallic-Coated Steel Roof Panels: Fabricated from aluminum-zinc alloy-coated steel sheet, ASTM A 792/A 792M, Class AZ50 Class AZM150.
 - 1. Nominal Metal Thickness: 0.034 inch (0.86 mm) or 0.040 inch (01.02 mm).
 - 2. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight epoxy primer and silicone-modified, polyester-enamel topcoat.
- C. Aluminum Roof Panels: Fabricated from aluminum sheet, ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer.
 - 1. Metal Thickness: 0.032 inch (0.8 mm) 0.040 inch (1.0 mm).
 - 2. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight epoxy primer and silicone-modified, polyester-enamel topcoat.

2.3 ACCESSORIES

- A. Provide components required for a complete roof panel assembly, including trim, fasciae, clips, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Formed from 0.025-inch (0.64-mm) nominal thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet. Provide flashing and trim as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal roof panels.
- C. Self-Adhering Sheet Underlayment, High Temperature: Butyl or SBS-modified asphalt; slip-resisting-polyethylene surfaced; with release-paper backing; cold applied. Stable after testing at 240 deg F (116 deg C) and passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
 - a. ATAS International, Inc.
 - b. Carlisle WIP Products; a brand of Carlisle Construction Materials
 - c. GCP Applied Technologies Inc.
 - d. Henry Company
 - e. Owens Corning
- D. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.
- E. Thermal Spacer Blocks: Fabricated from extruded polystyrene, 1 inch (25 mm) thick.
- F. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
 - 1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
 - 2. Aluminum Roof Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior and aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
 - 3. Provide metal closures at rake edges, rake walls and each side of ridge and hip caps.
 - 4. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
 - 5. Install ridge and hip caps as metal roof panel work proceeds.
- B. Install gaskets, joint fillers, and sealants where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants recommended by metal roof panel manufacturer.
- C. Separate dissimilar metals with a bituminous coating or self-adhering sheet underlayment.
- D. Coat back side of aluminum panels with bituminous coating where they will contact wood, ferrous metal, or cementitious construction.

END OF SECTION 074113

SECTION 074616 - ALUMINUM SIDING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Samples, and ICC-ES evaluation reports.
- B. Warranties: Manufacturer's standard from in which siding manufacturer agrees to repair or replace siding that fails in materials or workmanship within 10-20 years. Failures include, but are not limited to, deforming, fading, or otherwise deteriorating beyond normal weathering.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Siding: AAMA 1402.
 - 1. To match existing siding
 - 2. Vertical Pattern: 12-inch (406-mm) exposure in V-grooved, triple 5-1/3-inch (135-mm) style.
 - 3. Texture: To match existing.
 - 4. Finish: Three-coat polyvinylidene fluoride (PVDF), Primer and baked-on acrylic Primer and baked-on polyester.
- B. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
 - 1. Provide accessories made from same material as matching color and texture of adjacent siding unless otherwise indicated.
- C. Decorative Accessories: Provide the following aluminum decorative accessories as indicated:
 - 1. Louvers, salvaged existing mechanical louver, flashing and trim as required
 - 2. Moldings and trim.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install aluminum siding according to AAMA 1402.
 - 1. Install fasteners no more than to match existing siding o.c.

END OF SECTION 074616

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and Color Samples.
- B. Coordinate installation of sheet metal flashing and trim with adjoining roofing and wall materials, joints, and seams to provide a leakproof, secure, and noncorrosive installation.
- C. Fabricator Qualifications: For copings and low-slope roof edge flashings that are SPRI ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
- D. Warranty on Finishes: Manufacturer agrees to repair or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 10 to 20 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Standard: Comply with NRCA's "The NRCA Roofing Manual", SMACNA's "Architectural Sheet Metal Manual" and CDA's "Copper in Architecture Handbook" unless otherwise indicated. Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. FM Approvals' Listing: Manufacture and install roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.
- C. SPRI Wind Design Standard: Manufacture and install low-slope roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: Class 1-90, UL 90

2.2 SHEET METAL

- A. Copper: ASTM B 370; Temper H00 or H01, cold rolled, not less than 16 oz./sq. ft. (0.55 mm thick).
 - 1. Prepatinated Finish: To match Metal Roof prepatinated according to ASTM B 882.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, not less than 0.032 inch (0.8 mm) thick; finished as follows:
 - 1. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight, three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight, epoxy primer and silicone-modified, polyester-enamel topcoat.

2. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish.
- C. Zinc-Tin Alloy-Coated Stainless Steel: ASTM A 240/A 240M, Type 304, fully annealed stainless-steel sheet, not less than 0.015 inch (0.38 mm) thick, with 0.787-mil (0.020-mm) thickness zinc-tin alloy coating applied to each side; with factory-applied gray preweathering.
- D. Metallic-Coated Steel Sheet: Galvanized steel sheet, ASTM A 653/A 653M, G90 (Z275), or aluminum-zinc alloy-coated steel sheet, ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40 (Class AZM150 coating designation, Grade 275); 0.022-inch (0.56-mm) or 0.028-inch (0.71-mm) nominal thickness.
 1. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight, three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight, epoxy primer and silicone-modified, polyester-enamel topcoat.
 2. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish.

2.3 ACCESSORIES

- A. Felt Underlayment: ASTM D 226, Type II (No. 30) or Type I (No. 15), asphalt-saturated organic felts.
- B. Self-Adhering, High-Temperature Sheet Underlayment: Butyl or SBS-modified asphalt; slip-resisting-polyethylene surfaced; with release paper backing; cold applied. Stable after testing at 240 deg F (116 deg C) and passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
- C. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum.
- D. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners.
 1. Exposed Fasteners: Heads matching color of sheet metal roofing using plastic caps or factory-applied coating.
 2. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 3. Fasteners for Copper: Copper, hardware bronze, or Series 300 stainless steel.
 4. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 5. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.
 6. Fasteners for Metallic-Coated Steel Sheet: Hot-dip galvanized steel or Series 300 stainless steel.
- E. Solder for Copper: ASTM B 32, Grade Sn50.
- F. Solder for Zinc-Tin Alloy-Coated Stainless Steel: ASTM B 32, 100 percent tin.
- G. Butyl Sealant: ASTM C 1311, solvent-release butyl rubber sealant.
- H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FABRICATION

- A. Fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to the design, dimensions, geometry, metal thickness, and other characteristics of item indicated.
- B. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that are capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. All roof components to be of a Metal Roofing system selected by the contractor / owner during pricing phase

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with cited sheet metal standards. Allow for thermal expansion; set true to line and level. Install Work with laps, joints, and seams permanently watertight and weatherproof; conceal fasteners where possible.
- B. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- C. Seams: Fabricate nonmoving seams with flat-lock seams. For aluminum, form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to a width of 1-1/2 inches (38 mm); however, reduce pretinning where pretinned surface would show in completed Work.
 - 1. Do not solder metallic-coated steel and aluminum sheet.
 - 2. Do not pretin zinc-tin alloy-coated stainless steel.
 - 3. Do not use torches for soldering.
 - 4. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- E. Metal Protection: Where dissimilar metals contact each other, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating.
 - 1. Coat concealed side of aluminum with bituminous coating where it contacts wood, ferrous metal, or cementitious construction.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and color Samples.
- B. Warranties: Provide manufacturer's standard written warranty, without monetary limitation, signed by manufacturer agreeing to promptly repair or replace roof specialties that show evidence of deterioration of factory-applied finishes for the period of 10-20 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested according to SPRI ES-1 and capable of resisting 1-90 / UL 90.

2.2 ROOF SPECIALTIES

- A. Canted Roof-Edge Fascia: Manufactured, one-piece, roof-edge fascia consisting of snap-on or compression-clamped metal fascia cover and a continuous-formed, galvanized-steel sheet cant, 0.028 inch (0.71 mm) thick, minimum, with extended vertical leg terminating in a drip-edge cleat.
 - 1. Product to be a component of a comprehensive Metal Roof System
 - 2. Aluminum: 0.040 inch (1.02 mm), 0.050 inch (1.27 mm), 0.063 inch (1.60 mm), 0.080 inch (2.03 mm) or a compatible thickness with Metal Roof System.
 - 3. Prepainted, Zinc-Coated Steel: 0.028 inch (0.71 mm), 0.034 inch (0.86 mm), or a compatible thickness with Metal Roof System.
- B. One-Piece Metal Drip Edge: Manufactured, one-piece, with a horizontal flange and vertical leg, drain-through fascia terminating in a drip edge, and concealed splice plates of same material, finish, and shape as gravel stop.
 - 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
 - 2. Aluminum: 0.032 inch (0.81 mm), 0.040 inch (1.02 mm), 0.050 inch (1.27 mm), or a compatible thickness with Metal Roof System.
 - 3. Stainless Steel: 0.031 inch (0.79 mm) or a compatible thickness with Metal Roof System.
 - 4. Prepainted, Zinc-Coated Steel: 0.028 inch (0.71 mm), 0.034 inch (0.86 mm) or a compatible thickness with Metal Roof System.
- C. Gutters and Downspouts:
 - 1. Gutters: Manufactured in uniform section lengths, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front edge. Furnish expansion joints and expansion-joint covers.

- a. Gutter Style: Rectangular.
 - b. Aluminum: 0.050 inch (1.27 mm) or 0.063 inch (1.60 mm) thickness.
 - c. Prepainted, Zinc-Coated Steel: 0.028 inch (0.71 mm) 0.034 inch (0.86 mm) thick.
 - d. Gutter Supports: Gutter brackets, Straps, Spikes and ferrules, Manufacturer's standard supports with finish matching the gutters.
 - e. Carlisle Industrial Gutter System IG-2 / IG-B or comparable type
2. Downspouts: Plain rectangular with mitered rectangular elbows. Furnish wall brackets of same material and finish as downspouts, with anchors.
- a. Formed Aluminum: 0.032 inch (0.81 mm), 0.040 inch (1.02 mm), 0.050 inch (1.27 mm), 0.063 inch (1.60 mm) thickness.
 - b. Extruded Aluminum: 0.125 inch (3.18 mm) thickness.
 - c. Prepainted, Zinc-Coated Steel: 0.028 inch (0.71 mm), 0.034 inch (0.86 mm) thickness.
 - d. Carlisle Industrial Downspout or comparable type
- D. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces. Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
- 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
 - 2. Formed Aluminum: 0.024 inch (0.61 mm) or 0.050 inch (1.27 mm) thick.
 - 3. Stainless Steel: 0.019 inch (0.48 mm) or 0.025 inch (0.64 mm) thick.
 - 4. Zinc-Coated Steel: Nominal 0.022-inch (0.56-mm) or 0.028-inch (0.71-mm) thick.
- E. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped.
- 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
 - 2. Formed Aluminum: 0.024 inch (0.61 mm), 0.032 inch (0.81 mm) thick.
 - 3. Stainless Steel: 0.019 inch (0.48 mm), 0.025 inch (0.64 mm) thick.
 - 4. Zinc-Coated Steel: Nominal 0.022-inch (0.56-mm) or 0.028-inch (0.71-mm) thickness.

2.3 MATERIALS

- A. Copper Sheet: ASTM B 370, Temper H00 or H01, cold rolled, mill finish.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper as recommended by manufacturer for use and finish indicated.
- D. Aluminum Finish: Mill finish, Class I, clear anodic finish; complying with AAMA 611 Class II, clear anodic finish; complying with AAMA 611, Class I, color anodic finish; complying with AAMA 611, Class II, color anodic finish; complying with AAMA 611, Two-coat fluoropolymer system with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight, Three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight.
- E. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, No. 2B (bright, reflective), No. 3 (directional satin), No. 4 (fine directional satin) finish.

- F. Prepainted, Zinc-Coated Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation. Prepare, pretreat, and apply coating to comply with ASTM A 755/A 755M.
 - 1. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight; complying with AAMA 621, three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight; complying with AAMA 621.
- G. Felt Underlayment: ASTM D 226/D 226M, Type II (No. 30), Type I (No. 15), asphalt-saturated organic felts.
- H. Self-Adhering Sheet Underlayment, High Temperature: Butyl or SBS-modified asphalt; slip-resisting-polyethylene surfaced; with release paper backing; cold applied. Stable after testing at 240 deg F (116 deg C) and passes after testing at minus 20 deg F (29 deg C); ASTM D 1970
- I. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements.
 - 1. Exposed Penetrating Fasteners: Gasketed screws with heads matching color of metal.
 - 2. Fasteners for Copper Sheet: Copper, hardware bronze, or Series 300 stainless steel.
 - 3. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
 - 4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
 - 5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel.
- J. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant.
- K. Butyl Sealant: ASTM C 1311, solvent-release butyl rubber sealant.
- L. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement.
- B. Coat back side of aluminum or stainless-steel roof specialties with bituminous coating where they will contact wood, ferrous metal, or cementitious construction.
- C. Separate dissimilar metals with a bituminous coating or polymer-modified, bituminous sheet underlayment.
- D. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- E. Space movement joints at a maximum of 12 feet (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless indicated.
- F. Fastener Sizes: Use fasteners of sizes that will penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws,

substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Prein edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.
- H. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 12 inches (305 mm), 24 inches (610 mm), 30 inches (762 mm) apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
- I. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c.
- J. Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches (100 mm) over top edge of base flashings.

END OF SECTION 077100

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, manufacturer's color charts, and maintenance data.

PART 2 - PRODUCTS

2.1 DOOR ASSEMBLY

- A. Manufacturers: Overhead Door Corporation series 620 or equal
- B. Description:
 - 1. Operation Cycles: Not less than 10,000.
- C. Fire-Rated Doors: Complying with NFPA 80; listed and labeled by qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
 - 1. For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
 - 2. Fire Rating: 1 hour.
- D. Structural Performance, Exterior Doors: Capable of withstanding 20 lb/sq. ft. (960 Pa) design wind load.
- E. Windborne-Debris Impact Resistance: Provide impact-protective overhead coiling doors that pass missile-impact and cyclic-pressure tests according to ASTM E 1996 for Wind Zone 3
- F. Curtain Material and Finish: Galvanized steel or Aluminum with baked-enamel or powder-coated to match existing door finish.
- G. Curtain Slats: Flat-profile slats with solid surface
 - 1. Insulated or Non-Insulated-Slat Interior Facing: Metal.
- H. Hood: Match curtain material and finish, Galvanized steel or Aluminum.
- I. Manual Door Operator: Chain-hoist operator, Manufacturer's standard crank operator, Awning-crank operator, Wall-crank operator.
- J. Electric Door Operator: Standard duty operator with control station interior mounted similar to existing overhead door, mount above new overhead door.

1. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet (2.44 m) or lower.
 2. Emergency Manual Operation: Chain, Crank or Motorized type.
 3. Obstruction Detection Device: Automatic photoelectric sensor, electric sensor edge on bottom bar; self-monitoring type.
- K. Guide Tracks, Supports, and Hardware: Manufacturer's standard.
- L. Curtain Accessories: Equip door with weather seals, astragal, automatic closing device.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install door, track, and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports.
- B. Accessibility: Install doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.
- C. Install fire-rated doors according to NFPA 80.
- D. Power-Operated Doors: Install automatic garage door openers according to UL 325.
- E. Test and adjust controls and safeties.

END OF SECTION 083323

SECTION 23 34 00 – HVAC FAN**PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. The ceiling-mounted circulation fan is the model scheduled with the capacities indicated. The fan shall be furnished with standard mounting hardware and variable speed control to provide cooling and destratification.

B. Summary of Work

1. Installation of the fan, miscellaneous or structural metal work (if required), field electrical wiring, cable, conduit, fuses and disconnect switches, other than those addressed in the installation scope of work, shall be provided by others. Factory installation services are available through Big Ass Fans. Consult the appropriate installation scope of work for information on the available factory installation options, overview of customer and installer responsibilities, and details on installation site requirements

1.2 SUBMITTALS

- A. Shop Drawings: Drawings detailing product dimensions, weight, and attachment methods
- B. Product Data: Specification sheets on the ceiling-mounted fan, specifying electrical and installation requirements, features and benefits, and controller information
- C. Installation Guide: The manufacturer shall furnish a copy of all operating and maintenance instructions for the fan. All data is subject to change without notice.

PART 2 PRODUCT**2.1 MANUFACTURER**

- A. Delta T LLC, dba Big Ass Fans, PO Box 11307, Lexington, Kentucky 40575. Phone (877) 244-3267. Fax (859) 233-0139. Website: www.bigassfans.com

2.2 HIGH VOLUME, LOW SPEED FANS – BIG ASS FANS BASIC 6®**A. Complete Unit**

1. Regulatory Requirements: The entire fan assembly shall be NRTL-certified and built pursuant to the construction guidelines set forth by UL standard 507 and CSA standards 22.2 No. 60335-1 and 22.2 No. 113.

- a. Sustainability Characteristics: The fan shall be designed to move an effective amount of air for cooling and destratification in industrial applications over an extended life. The fan components shall be designed specifically for high volume, low speed fans to ensure lower operational noise. Sound levels from the fan operating at maximum speed measured in a laboratory setting shall not exceed 55 dBA. Actual results of sound measurements in the field may vary due to sound reflective surfaces and environmental conditions.
- b. Good workmanship shall be evident in all aspects of construction. Field balancing of the airfoils shall not be necessary.

B. Airfoil System

1. The fan shall be equipped with six (6) Powerfoil airfoils of precision extruded aluminum alloy. The airfoils shall be connected by means of two (2) high strength locking bolts per airfoil. The airfoils shall be connected to the hub and interlocked with zinc plated steel retainers.
2. The fan shall be equipped with six (6) Powerfoil winglets on the ends of the airfoils. The winglets shall be molded of a polypropylene blend. The standard color of the winglet shall be "BAF Yellow."
3. Airfoil Restraint System
 - a. All 20- to 24-ft (6- to 7.3-m) diameter fans shall be equipped with a patented airfoil restraint system to provide redundant safety between the ends of the airfoils and the fan hub. The airfoil restraint system shall be available as an option on smaller diameter fans.
 - b. The airfoil restraint system shall be comprised of durable, lightweight nylon safety straps that shall extend from winglets through the airfoils and secure to the fan hub with 12-gauge stamped steel safety clips.
 - c. The straps shall be made of 1 in. (24 mm) wide heavy-duty nylon webbing rated for 825 lb (374 kg). The loops at the ends of the straps shall be secured in a double-stitch pattern for reinforced durability.
 - d. The straps shall be precisely matched to each fan's diameter, eliminating the need for a tensioning mechanism and reducing the opportunity for noise.
 - e. The straps shall run along the inside of the airfoils for an uninterrupted look.
 - f. Safety clips shall secure to each winglet to comprise the outer anchor points and provide tension, while clips on the opposite end shall secure to threaded inserts incorporated in the fan hub.

C. Motor

1. The fan motor shall be an AC induction type inverter rated at 1725 RPM, 200–240/400–480 VAC, 50/60 Hz, three-phase.
2. The motor shall be totally enclosed, fan cooled (TEFC) with an IP56. A B5 standard frame shall be provided for ease of service. The motor shall be manufactured with a double baked Class F insulation and be capable of continuous operation in 5° F to 104° F (-15° C to 40° C) ambient conditions.

D. Gearbox

1. The gearbox shall be a helical gear reducer, precision finished from hardened steel for low noise and long service life with double lip seals to retain oil and prevent contamination. The gearbox shall be lubricated for life. The gear reducer shall have a standard backlash of less than 25 arc minutes and be equipped with a 17-4 stainless steel shaft of 1-1/4" (3.2 cm) diameter.

E. Motor Frame

1. The motor frame and mount shall be constructed of steel and powder coated for corrosion resistance and appearance.

F. Mounting System

1. The fan mounting system shall be designed for quick and secure installation on a variety of structural supports. The design of the upper mount shall provide two axes of rotation. This design shall allow for adjustments to be made after the mount is installed to the mounting structure to ensure the fan will hang level from the structure.
2. The upper mount shall be of ASTM A-36 steel, at least 3/16" thick, and powder coated for appearance and corrosion resistance. No mounting hardware or parts substitutions, including cast aluminum, are acceptable.
3. All mounting hardware shall be SAE Grade 8 or equivalent.

G. Hub

1. The fan hub shall be 19" (48 cm) in diameter and shall be made of precision cut aluminum for high strength and light weight. The hub shall consist of two (2) aluminum plates, six (6) aluminum spars, and one (1) aluminum spacer fastened with a pin and collar rivet system. The overall design shall provide a flexible assembly such that force loads experienced by the hub assembly shall be distributed over a large area to reduce the fatigue experienced at the attachment point for the fan blade.
2. The hub shall be secured to the output shaft of the gearbox by means of a steel coupling interface. The hub shall incorporate three (3) safety retaining clips made of 1/4" (0.6 cm) thick steel that shall restrain the hub/airfoil assembly.

H. Safety Cables

1. The fan shall be equipped with an upper safety cable that provides an additional means of securing the fan assembly to the building structure. The upper safety cable shall have a diameter of $\text{Ø}3/8$ " (1 cm).
2. The fan shall be equipped with two lower safety cables pre-attached to the fan hub that shall provide an additional means of securing the fan to the extension tube. The lower safety cables shall have a diameter of 1/4" (0.6 cm).
3. The safety cables shall be fabricated out of 7 x 19 galvanized steel cable. The end loops shall be secured with swaged Nicopress® sleeves, pre-loaded and tested to 3,200 lbf (13,345 N).
4. Field construction of safety cables is not permitted.

I. Variable Frequency Drive

1. The Variable Frequency Drive (VFD) shall be a NEMA 4X VFD that is factory programmed to minimize starting and braking torques. The VFD shall have touchpad controls and an LED display for controlling the fan's direction, operation, speed, and programming. The VFD may be equipped with an EMI/RFI filter to limit interference with other electronic equipment and a rotary switch disconnect for lock-out/tag-out requirements.
2. Onboard Variable Frequency Drive: The VFD may be mounted on the fan motor frame. A wall-mounted digital variable speed controller shall be provided for such installations, allowing access to all VFD functions.
3. Wall-Mounted Variable Frequency Drive: The VFD may be wall-mounted for ease of access.

J. Digital Variable Speed Wall Controller

1. The fan shall be equipped with a digital variable speed wall controller. The controller user interface shall be an intuitive touchscreen interface.
2. The controller shall be mounted to a standard rectangular or square outlet box.
3. A 150-ft (45.7-m) CAT5 cable shall be provided for connecting the controller to the fan's VFD and to provide power to the controller.
4. The controller mounting location shall meet the requirements of OSHA standard 29 CFR 1910.303(g) for accessibility minimum clearances.
5. The controller shall have an IP55 rating.
6. The controller shall provide fan start/stop, speed, and direction control functions.
7. The controller shall provide diagnostic and fault history information for the connected fan, as well as the ability to configure fan parameters with the assistance of Big Ass Fans Customer Service.
8. The controller interface shall be able to be secured with a passcode to prevent unauthorized access to fan controls and settings.
9. The controller shall operate out of the box without setup and upon connection to CAT5 cable.

K. BAFCon Controller (Optional)

1. The fan shall have the option of operating with the BAFCon controller.
2. The digital controller user interface shall be a wall-mounted touchscreen with a 5-inch (127-mm) display and an 800 (RGB) x 480 pixel resolution.
3. The digital controller shall be mounted to a standard rectangular or square outlet box.
4. The digital controller mounting location shall meet the requirements of OSHA standard 29 CFR 1910.303(g) for accessibility minimum clearances.
5. The digital controller shall support up to eight Basic 6 fans controlled as a group or individually.
6. The digital controller shall provide fan start/stop, speed, and direction control functions.

7. The digital controller shall provide diagnostic and fault history information for each connected fan as well as the ability to configure fan parameters with the assistance of Big Ass Fans Customer Service.
 8. The digital controller shall include optional SmartSense functionality to maximize energy savings. SmartSense shall provide the capability to automatically control the speed of Big Ass Fans using information from user-determined settings and built-in temperature and humidity sensors.
 9. The digital controller shall include a scheduling feature that shall provide the ability to create up to four fan schedules for turning fans on/off and turning Auto mode on/off. The scheduling feature shall require the date and time to be set on the controller.
 10. The digital controller interface shall be able to be secured with user and admin passcodes to prevent unauthorized access to fan controls and settings.
 11. The digital controller shall be BACnet-compatible.
- L. Fire Control Panel Integration
1. Includes a 10–30 VDC pilot relay for seamless fire control panel integration. The pilot relay can be wired Normally Open or Normally Closed in the field.
- M. Guy Wires
1. Included for installations with extension tubes 4 ft (1.2 m) or longer to limit the potential for lateral movement.

PART 3 EXECUTION

3.1 PREPARATION

- A. Fan location shall have a typical bar joist or existing I-beam structure from which to mount the fan. Additional mounting options may be available.
- B. Mounting structure shall be able to support weight and operational torque of fan. Consult structural engineer if necessary.
- C. Fan location shall be free from obstacles such as lights, cables, or other building components.
- D. Check fan location for proper electrical requirements. Consult installation guide for appropriate circuit requirements.
- E. Each fan requires dedicated branch circuit protection.

3.2 INSTALLATION

- A. The fan shall be installed by a factory-certified installer according to the manufacturer's Installation Guide, which includes acceptable structural dimensions and proper sizing and

placement of angle irons for bar joist applications. Big Ass Fans recommends consulting a structural engineer for installation methods outside the manufacturer's recommendation and a certification, in the form of a stamped print or letter, submitted prior to installation.

B. Minimum Distances

1. Airfoils must be at least 10 ft (3.05 m) above the floor.
2. Installation area must be free of obstructions such as lights, cables, sprinklers, or other building structures with the airfoils at least 2 ft (0.61 m) clear of all obstructions.

C. The fan shall not be located where it will be continuously subjected to wind gusts or in close proximity to the outputs of HVAC systems or radiant heaters. Additional details are in the Big Ass Fans Installation Manual.

D. In buildings equipped with sprinklers, including ESFR sprinklers, fan installation shall comply with all of the following:

1. The maximum fan diameter shall be 24 ft (7.3 m).
2. The HVLS fan shall be centered approximately between four adjacent sprinklers.
3. The vertical clearance from the HVLS fan to the sprinkler deflector shall be a minimum of 3 ft (0.9 m).
4. All HVLS fans shall be interlocked to shut down immediately upon receiving a waterflow signal from the alarm system in accordance with the requirements of NFPA 72—National Fire Alarm and Signaling Code.

E. If the SmartSense feature will be used, the BAFCon controller must not be mounted adjacent to or above a radiant heat source, near HVAC ventilation intakes/exhausts, on a poorly insulated exterior wall, or in a different temperature/humidity environment than the fan(s) it will control. Additional mounting guidelines can be found in the controller installation guide.

END OF SECTION

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 70.

2.2 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- C. Conductor Insulation:
- D.
 - 1. Type THHN and Type THWN-2: Comply with UL 83.
 - 2. Type XHHW-2: Comply with UL 44.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
 - 1. Aboveground Circuits (No. 10 AWG and smaller):
 - a. Connectors: Solderless, screw-on, reusable pressure cable type, rated 600 V, 90° C, with integral insulation, approved for copper conductors.
 - b. The integral insulator shall have a skirt to completely cover the stripped wires.
 - c. The number, size, and combination of conductors, as listed on the manufacturers packaging, shall be strictly followed.
 - d. Use of "push-in" type splice connectors is not permitted.
 - 2. Aboveground Circuits (No. 8 AWG and larger):
 - a. Cable termination lugs shall be made of high conductivity and corrosion-resistant material, electro-tin plated, listed for use with copper conductors only, rated for 600V. Lugs shall be color coded by size.

- b. Cable termination lugs shall be indent type, long barrel with chamfered entry, 2 - hole, compression type for 250 kcmil and above, 1-hole for less than 250 kcmil.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Feeders and Branch Circuits: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Service Entrance: **[Type THHN/THWN, single conductors in raceway]**
- C. Exposed Feeders, Branch Circuits, and Class 1 Control Circuits, Including in Crawlspace: **[Type THHN/THWN, single conductors in raceway]**
- D. Feeders and Branch Circuits Concealed in Ceilings, Walls, Partitions, and Crawlspace: **[Type THHN/THWN, single conductors in raceway]**
- E. Feeders and Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: **[Type THHN/THWN, single conductors in raceway]**
- F. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, and strain-relief device at terminations to suit application.
- G. Class 2 Control Circuits: **[Type THHN/THWN, in raceway]**

3.2 INSTALLATION OF CONDUCTORS AND CABLES

- A. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- B. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."
- C. Complete cable tray systems installation according to Section 260536 "Cable Trays for Electrical Systems" prior to installing conductors and cables.
- D. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- E. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."
- F. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- G. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway. Use manufacturer-approved pulling compound or lubricant where necessary.

- H. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- I. Make splices, terminations, and taps that are compatible with conductor material. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors. Install conductor at each outlet, with at least 6 inches (150 mm)] of slack.
- J. Identify conductors and cables according to Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Contractor will perform tests and inspections to verify proper installation.
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors and conductors feeding all critical equipment and services for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters. Cables will be considered defective if they do not pass tests and inspections.
- B. Test and Inspection Reports: Prepare a written report showing procedures used, results complying with requirements, and corrective action taken to achieve compliance.

END OF SECTION 260519

SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 TIME SWITCHES

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. **[Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917] [Electromechanical-Dial Time Switches: Comply with UL 917].**
1. Contact Configuration: **[SPST] [DPST] [SPDT] [DPDT] <Insert configuration>**.
 2. Contact Rating: **[30-A inductive or resistive, 240 V ac] [20-A ballast load, 120/240 V ac] <Insert rating>**.
 3. Circuitry: Allow connection of a photoelectric relay as substitute for on-off function of a program.
 4. Astronomical time dial.
 5. Eight-Day Program: Uniquely programmable for each weekday and holiday.
 6. Skip-a-day mode.
 7. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of **[16] <Insert number>** hours.

2.3 OUTDOOR PHOTOELECTRIC SWITCHES

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. Solid state, with **[SPST] [DPST]** dry contacts rated for **[1000-W incandescent] [or] [1800-VA inductive] <Insert value>**, to operate connected relay, contactor coils, and microprocessor input; complying with UL 773A, and compatible with ballasts and LED lamps.
1. **[Available]Products:**
 - a. **<Insert manufacturer's name; product designation>**.
 2. Light-Level Monitoring Range: **1.5 to 10 fc (16.14 to 108 lx)**, with an adjustment for turn-on and turn-off levels within that range.
 3. Time Delay: 15-second minimum.

4. Surge Protection: Metal oxide varistor.

2.4 DAYLIGHT-HARVESTING SWITCHING CONTROLS

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. Indoor, Ceiling-Mounted Photoelectric Switch: Solid-state, light-level sensor unit complying with UL 773A, with separate relay unit [**mounted on luminaire,**] rated for [20] **<Insert amperage>**-A [ballast] [or] [LED] load at 120 and 277 V ac. Cadmium sulfide photoresistors are not acceptable.
 1. Switch Rating: Dry contacts rated for 20-A [ballast] [or] [LED] load at 120 and 277 V ac, for 13-A tungsten at 120 V ac, and for 1 hp at 120 V ac.
 2. Light-Level Monitoring Range: [10 to 200 fc (108 to 2152 lx)] [100 to 1000 fc (1080 to 10 800 lx)], with an adjustment for turn-on and turn-off levels within that range.
 3. Time Delay: Adjustable from 5 to 300 seconds.
 4. Set-Point Adjustment: With deadband adjustment of 25, 50, and 75 percent above the "on" set point, or provide with separate adjustable "on" and "off" set points.
 5. Indicator: Two LEDs.

2.5 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.
 1. Type: [Passive infrared] [Adaptive technology] [Dual technology (passive infrared and ultrasonic)].
 2. Voltage: 120/277 V.
 3. Switch Rating: Not less than 800-VA [ballast] [or] [LED] load at 120 V, 1200-VA [ballast] [or] [LED] load at 277 V, and 800-W incandescent.
 4. Time Delay: Adjustable up to [20] [30] minutes.
 5. Field of View: [110] [150] [180] degrees.
 6. Minimum Coverage Area: [900 sq. ft. (84 sq. m)] [1200 sq. ft. (111 sq. m)].

2.6 OUTDOOR MOTION SENSORS

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. Solid-state outdoor motion sensors.
 1. Type: Passive infrared.
 2. Switch Rating:
 - a. Luminaire-Mounted Sensor: [1000-W incandescent, 500-VA fluorescent/LED] **<Insert rating>**.
 - b. Separately Mounted Sensor: Dry contacts rated for 20-A [ballast] [or] [LED] load at 120 and 277 V ac, for 13-A tungsten at 120 V ac, and for 1 hp at 120 V ac.
 3. Voltage: 120/277 V.
 4. Time Delay: Adjustable up to 15 minutes.
 5. Detection Coverage: 180-degree field of view and 110-foot (34-m) detection range.

2.7 LIGHTING CONTACTORS

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. Electrically operated and [**mechanically**] [**electrically**] held, combination type with [**fusible switch**] [**nonfused disconnect**], complying with NEMA ICS 2 and UL 508.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install and aim sensors in locations to achieve at least 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.
- B. Install field-mounting transient voltage suppressors for lighting control devices in Category A locations that do not have integral line-voltage surge protection.
- C. Label time switches and contactors with a unique designation.
- D. Verify actuation of each sensor and adjust time delays.

END OF SECTION 260923

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
- B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Utility Locator Service: Notify utility locator service, "811", "Call Before You Dig", "Dig Safe System", "One Call", for area where Project is located before site clearing.
- D. Do not commence site-clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- E. Soil Stripping, Handling, and Stockpiling: Perform only when topsoil is dry or slightly moist.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect remaining trees and shrubs from damage and maintain vegetation. Employ a licensed arborist to repair tree and shrub damage. Restore damaged vegetation. Replace damaged trees that cannot be restored to full growth, as determined by arborist.
- D. Do not store materials or equipment or permit excavation within drip line of remaining trees.
- E. Protect site improvements to remain from damage. Restore damaged improvements to condition existing before start of site clearing.
- F. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction, a sediment and erosion control plan, specific to the site, that complies with EPA document No. EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- G. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

3.2 SITE CLEARING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.
 1. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
 2. Chip brush, branches, and trees and stockpile in areas approved by Architect dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
- C. Strip topsoil. Remove sod and grass before stripping topsoil. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade stockpiles to drain water.
 1. Stockpile surplus topsoil to allow for respreading deeper topsoil.
- D. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- E. Remove existing concrete, slabs, paving, curbs, gutters, and aggregate base as indicated.
 1. Neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement.
- F. Dispose of waste materials and excess topsoil, off Owner's property. Burning waste materials on-site is not permitted.
 1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Unauthorized excavation consists of excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- B. Utility Locator Service: Notify utility locator service, "811", "Call Before You Dig", "Dig Safe System", "One Call" for area where Project is located before beginning earthmoving operations.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Soil for Infill: ASTM D1557, each 12" lift to be compacted to 95% of the materials maximum Modified Proctor dry density. Acceptable USCS Classifications: SW, SP, SW-SM, SW-SC, SP-SM, SP-SC, Structural Fill (Granular), Non-plastic, Less than 12% passing No. 200 sieve.
- B. Satisfactory Soil: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, or other deleterious matter.
- C. Unsatisfactory Soil: ASTM D 2487 Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT.
- D. Backfill and Fill: Satisfactory soil materials.
- E. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- G. Drainage Course: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and zero to 5 percent passing a No. 8 (2.36-mm) sieve.
- H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Protect and maintain erosion and sedimentation controls during earthmoving operations.
- B. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.
- C. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- D. Explosives: Do not use explosives, obtain written permission from authorities having jurisdiction before bringing explosives to Project site or using explosives on Project site.
- E. Excavate to subgrade elevations regardless of character of materials and obstructions encountered.
- F. Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents.
- G. Excavate for structures, building slabs, pavements, and walkways. Trim subgrades to required lines and grades.
- H. Utility Trenches: Excavate trenches to indicated slopes, lines, depths, and invert elevations. Shape subgrade to provide continuous support.
 - 1. Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations.
 - 2. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit. Place and compact final backfill of satisfactory soil material to final subgrade.
- I. Proof-roll subgrade below the building slabs with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes)] to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- J. Plow strip or break up sloped surfaces steeper than 1 vertical to 4 horizontal to receive fill.
- K. Place backfill and fill in layers not more than 8 inches (200 mm) in loose depth at optimum moisture content. Compact each layer under structures, building slabs, pavements, and walkways to 95 percent of maximum dry unit weight according to ASTM D 698; elsewhere to 85 percent.
- L. Grade areas to a smooth surface to cross sections, lines, and elevations indicated. Grade lawns, walkways, and unpaved subgrades to tolerances of plus or minus 1 inch (25 mm) and pavements and areas within building lines to plus or minus 1/2 inch (13 mm).

- M. Under pavements and walkways, place subbase course material on prepared subgrades and compact at optimum moisture content to required grades, lines, cross sections, and thicknesses.
- N. Under slabs-on-grade, place drainage course on prepared subgrade and compact to required cross section and thickness.
- O. Allow testing agency to inspect and test each subgrade and each fill or backfill layer and to verify compliance with requirements.
- P. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000