

**PROJECT MANUAL  
FOR**

**Coastal Carolina Community  
College**

**Maintenance Trail Lighting  
and  
Infrastructure**

**Jacksonville, North Carolina**



**BOWMAN MURRAY HEMINGWAY ARCHITECTS**  
**514 Market Street**  
**Wilmington, NC 28401**

**November 17, 2023**



**Coastal Carolina Community College  
Maintenance Trail Lighting and Infrastructure  
Jacksonville, North Carolina**

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## INVITATION TO BID

Coastal Carolina Community College invites licensed general contractors to bid on construction of the Maintenance Trail Lighting and Infrastructure. Sealed proposals will be received until Tuesday, December 19, 2023, at 1:00 pm in the Conference Room of the Institutional Support Services Building at Coastal Carolina Community College, 444 Western Boulevard, Jacksonville, North Carolina 28546.

The project scope involves:

Lighting, Security camera and fiber optic infrastructure improvements to the Maintenance Trail on the main campus of Coastal Carolina Community College. Work includes, but is not limited to, new pole mounted area lighting, new security cameras and new fiber optic infrastructure to the existing Annex Building, including new equipment enclosure and cabling.

Licensed General Contractors must have a minimum of five (5) years of experience on competitively bid publicly funded construction projects e.g. City, County, State or School Systems.

A Mandatory Pre-Bid Conference will be held on Tuesday, December 5, 2023, at 1:00 pm, in the Conference Room of the Institutional Services Building at Coastal Carolina Community College, 444 Western Boulevard, Jacksonville, North Carolina 28546. The design consultant and a representative from Coastal Carolina Community College will be available at that time to answer questions concerning the project. Questions after that time shall be submitted in writing to the design consultant, Bowman Murray Hemingway Architects, Daniel Hill, [hill@bmharch.com](mailto:hill@bmharch.com), 514 Market St. Wilmington, NC 28401.

Complete plans and specifications may be obtained from design consultant Bowman Murray Hemingway Architects, 514 Market St., Wilmington, NC 28401, (910-762-2621) during normal office hours beginning Monday, November 20, 2023. A refundable plan deposit in the amount of \$100 is required. Partial sets will not be available. Plan deposits shall be mailed to Bowman Murray Hemingway Architects, 514 Market St., Wilmington, NC 28401, attention Susie Bowers. The deposit will be refunded upon return of the Contract Documents in good condition within thirty (30) days. PDF versions of the construction documents may be obtained by emailing [bowers@bmharch.com](mailto:bowers@bmharch.com) and are available at no cost.

A Bid Bond is required for this contract.

Performance and Payment Bonds not required for this contract.

G.S 143-128.2 establishes a ten percent (10%) goal for participation by minority business in the total value of work for each State building project. The contractor shall include with his bid a completed Identification of HUB Certified/Minority Business Participation form. Contractor shall submit completed Appendix E MBE Documentation for Contract Payments form with final payment request.

The owner reserves the unqualified right to reject any and all proposals.

Signed:

Designer:

W. Daniel Hill, AIA  
Bowman Murray Hemingway Architects  
514 Market Street  
Wilmington, NC 28401  
Telephone: 910-762-2621

Owner:

Trustees for  
Coastal Carolina Community College  
444 Western Boulevard  
Jacksonville, North Carolina 28546  
Telephone: 910-455-1221



**STATE OF NORTH CAROLINA  
STANDARD FORM OF INFORMAL CONTRACT  
AND GENERAL CONDITIONS**

FOR

Coastal Carolina Community College  
Maintenance Trail Lighting and Infrastructure  
Jacksonville, North Carolina

**SCOPE OF WORK**

Project includes, but is not limited, to the following:

Lighting, Security camera and fiber optic infrastructure improvements to the Maintenance Trail on the main campus of Coastal Carolina Community College. Work includes, but is not limited to, new pole mounted area lighting, new security cameras and new fiber optic infrastructure to the existing Annex Building, including new equipment enclosure and cabling.

**NOTICE TO BIDDERS**

Sealed bid for this work will be received by:

Ms. Carol Lurz  
Director of Physical Plant & Auxiliary Services  
Coastal Carolina Community College  
444 Western Boulevard  
Jacksonville, North Carolina 28546

*up to Tuesday, December 19, 2023, at 1:00 pm* in the Conference Room of the Institutional Support Services Building (Room 207) at 444 Western Boulevard, Jacksonville, NC 28546, and immediately thereafter publicly opened and read aloud. Complete plans and specifications can be obtained from:

Bowman Murray Hemingway Architects  
514 Market Street  
Wilmington, North Carolina 28401  
910-762-2621  
bowers@bmharch.com

Plan Deposit is \$100.00.

Electronic copies of plans and specifications will be distributed in PDF format at no cost.

Contractors are hereby notified that they must have proper license under the State laws governing their respective trades and that North Carolina General Statute 87 will be observed in receiving and awarding contracts.

Bids will be received for a single prime contract. All proposals shall be lump sum.

No bid may be withdrawn after the opening of bids for a period of 60 days. The Owner reserves the right to reject any or all bids and waive informalities. Bids shall be made only on the BID/ACCEPTANCE form provided herein with all blank spaces for bids properly filled in and all signatures properly executed.

Please note on the envelope –

Bid : Attn: Ms. Carol Lurz  
Coastal Carolina Community College  
Maintenance Trail Lighting and Infrastructure  
(Contractor)  
(License Number)

An open **mandatory pre-bid conference** will be held for all interested bidders on Tuesday, December 5, 2023, at 1:00 pm in the Conference Room of the Institutional Support Services Building at 444 Western Boulevard, Jacksonville, NC 28546. The meeting will address project specific questions, issues, bidding procedures and bid forms.

NOTE: The bidder shall include with the bid proposal the form *Informal Minority Business Participation* identifying the minority business participation it will use on the project. Forms and instructions are included within the Proposal Form in the bid documents. Failure to complete these forms is grounds for rejection of the bid. (GS143-128.2c Effective 1/1/2002.)



**BID/ACCEPTANCE FORM**  
for  
Coastal Carolina Community College  
Maintenance Trail Lighting and Infrastructure  
Jacksonville, North Carolina

We are in receipt of Addendum \_\_\_\_\_1 \_\_\_\_\_2 \_\_\_\_\_3 \_\_\_\_\_4

The undersigned, as bidder, proposes and agrees if this bid is accepted to contract with the State of North Carolina through Coastal Carolina Community College for the furnishing of all materials, equipment, and labor necessary to complete the construction of the work described in these documents in full and complete accordance with plans, specifications, and contract documents, and to the full and entire satisfaction of the State of North Carolina and Bowman Murray Hemingway Architects for the sum of:

**BASE BID:** \_\_\_\_\_ **Dollars \$** \_\_\_\_\_

Respectively submitted this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

\_\_\_\_\_  
**(Contractor's Name)**

Federal ID#: \_\_\_\_\_

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

Witness: \_\_\_\_\_

Title: \_\_\_\_\_  
(Owner, partner, corp. Pres. Or Vice President)  
Address: \_\_\_\_\_

\_\_\_\_\_  
(Proprietorship or Partnership)

Attest: (corporation)

Email Address: \_\_\_\_\_

**(Corporate Seal)**

By: \_\_\_\_\_ License #: \_\_\_\_\_

Title: \_\_\_\_\_  
(Corporation, Secretary./Ass't Secretary.)

**ACCEPTED by the STATE OF NORTH CAROLINA**  
through the

Coastal Carolina Community College

Total amount of accepted by the owner, included base bid and bid alternates: \_\_\_\_\_

Coastal Carolina Community College

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

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

## **GENERAL CONDITIONS**

### **1. GENERAL**

It is understood and agreed that by submitting a bid that the Contractor has examined these contract documents, drawings and specifications and has visited the site of the Work and has satisfied himself relative to the Work to be performed.

### **2. DEFINITIONS**

**Owner:** "Owner" shall mean, The State of North Carolina through Coastal Carolina Community College.

**Contractor:** "Contractor" shall mean the entity that will provide the services for the Owner.

**Designer:** The **designer(s)** are those referred to within this contract, or their authorized representatives. The Designer(s), as referred to herein, shall mean architect and/or engineer responsible for preparing the project plans and specifications. They will be referred to hereinafter as if each were of the singular number, masculine gender.

**Contract Documents:** "Contract Documents" shall consist of the Notice to Bidders; General Conditions of the Contract; special conditions if applicable; Supplementary General Conditions; the drawing and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the bid; the contract; the performance bond if applicable; and insurance certificates. All of these items together form the contract.

### **3. INTENT AND EXECUTION OF DOCUMENTS**

The drawings and specifications are complementary, one to the other. That which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a complete job. In case of discrepancy or disagreement in the Contract Documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings, small-scale drawings.

In such cases where the nature of the work requires clarification by the Designer/ Owner, the Designer/ Owner shall furnish such clarification. Clarifications and drawings shall be consistent with the intent of the Contract Documents, and shall become a part thereof.

### **4. AS-BUILT MARKED-UP CONSTRUCTION DOCUMENTS**

Contractor shall provide one complete set of legible "as-built" marked-up construction drawings and specifications recording any and all changes made to the original design during the course of construction. In the event no changes occurred, submit construction drawings and specifications set with notation "No Changes." The Designer/Owner must receive "As-built" marked-up construction drawings and specifications before the final pay request can be processed.

### **5. SUBMITTAL DATA**

The Contractor awarded the contract shall submit all specified submittals to the Owner/Designer. A minimum number of copies as specified by the owner, of all required submittal data pertaining to construction, performance and general dimensional criteria of the components listed in the technical specifications shall be submitted. No material or equipment shall be ordered or installed prior to written approval of the submittals by the Designer/Owner. Failure to provide submittal data for review on equipment listed in the technical specifications will result in removal of equipment by the Contractor at his expense if the equipment is not in compliance with the specifications.

### **6. SUBSTITUTIONS**

In accordance with the provisions of G.S. 133-3, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until five (5) days prior to the receipt of bids or by the date specified in the pre bid conference, when submitted to the Designer with sufficient

data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

- a. Name, address, and telephone number of manufacturer and supplier as appropriate.
- b. Trade name, model or catalog designation.
- c. Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.
- d. Detailed comparison with specified products including performance capabilities, warranties, and test results.
- e. Other pertinent data including data requested by the Designer to confirm product equality.

If a proposed material, product, or equipment substitution is deemed equal by the Designer to those specified, all bidders of record will be notified by Addendum.

## **7. WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE**

The contractor shall maintain, in readable condition at his job site one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the owner, designer or his authorized representative.

The contractor shall maintain at the job site, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the contractor and submitted to the designer upon project completion and no later than 30 days after acceptance of the project.

## **8. MATERIALS, EQUIPMENT, EMPLOYEES**

- a. The contractor shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, lights, power, fuel, heat, sanitary facilities, water, scaffolding and incidentals necessary for the completion of his work, and shall install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same, and shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied therefrom, all in accordance with the contract documents.
- b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.
- c. Upon notice, the contractor shall furnish evidence as to quality of materials.
- d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. However, the contractor shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. Request for substitution of materials, items, or equipment shall be submitted to the designer for approval or disapproval; the designer prior to the opening of bids shall make such approval or disapproval. Alternate materials may be requested after the award if it can clearly be demonstrated that it is an added benefit to the owner and the designer and owner approves.

- e. The designer is the judge of equality for proposed substitution of products, materials or equipment.
- f. If at any time during the construction and completion of the work covered by these contract documents, the language, conduct, or attire of any workman of the various crafts be adjudged a nuisance to the owner or designer, or if any workman be considered detrimental to the work, the contractor shall order such parties removed immediately from grounds.
- g. The Contractor shall cooperate with the designer and the owner in coordinating construction activities.
- h. The Contractor shall maintain qualified personnel and effective supervision at the site at all times during the project, and exercise the appropriate quality control program to ensure compliance with the project drawings and specifications. The designer is responsible for determining compliance with the drawings and specifications.

## **9. CODES, PERMITS AND INSPECTIONS**

The Contractor shall obtain the required permits, if required, give all notices, and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the Contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the Designer in writing. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the Owner, he shall bear all cost arising there from.

All work under this contract shall conform to the current North Carolina Building Code and other state and national codes as are applicable.

Projects constructed by the State of North Carolina or by any agency or institution of the State are not subject to county or municipal building codes and may\* not be subject to inspection by county or municipal authorities. Where appropriate, the Contractor shall, cooperate with the county or municipal authorities by obtaining building permits. The contractor at no cost may obtain permits to the owner.

All fire alarm work shall be in accordance with the latest State Construction Office (SCO) *Guidelines for Fire Alarm Installation* (NFPA72). Where the contract documents are in conflict with the SCO guidelines, the SCO guidelines shall govern. The Contractor shall be responsible for all the costs for the correction of the work where he installs it in conflict with the latest edition of the SCO *Guidelines for Fire Alarm Installation*.

## **10. PROTECTION OF WORK, PROPERTY, THE PUBLIC AND SAFETY**

- a. The contractors shall be jointly responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the owner or designer, and by laws or ordinances governing such conditions. They shall be responsible for any damage to the owner's property or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. They shall be responsible for and pay for any damages caused to the owner. All contractors shall have access to the project at all times, except as indicated in the Supplemental General Conditions.
- b. The contractor shall provide cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building, whether set by him, or any of the subcontractors. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the owner.
- c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the designer and owner.
- d. The contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations by building substantial boxes around it. He shall barricade all walks, roads, etc., as directed by the

designer to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

- e. The contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. *Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. He shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. He shall protect against damage or injury resulting from falling materials and he shall maintain all protective devices and signs throughout the progress of the work.
- f. The contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155.
- i. In the event of emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the contractor is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage. Any compensation claimed by the contractor on account of such action shall be determined as provided for under Article 13(b).
- j. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

## **11. SUBCONTRACTS AND SUBCONTRACTORS**

The Contractor is and remains fully responsible for his own acts or omissions as well as those of any subcontractor or of any employee of either. The Contractor agrees that no contractual relationship exists between the subcontractor and the Owner in regard to the contract, and that the subcontractor acts on this work as an agent or employee of the Contractor.

## **12. CONTRACTOR-SUBCONTRACTOR RELATIONSHIPS**

The Contractor agrees that the terms of these Contract Documents shall apply equally to each Subcontractor as to the Contractor, and the Contractor agrees to take such action as may be necessary to bind each Subcontractor to these terms. The Contractor further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to Contractor-Subcontractor relationships. The Owner reserves the right to limit the amount of portions of work to be subcontracted as hereinafter specified.

## **13. CHANGES IN THE WORK AND CLAIMS FOR EXTRA COST**

- a. The owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the contractor from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.
- b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order from the designer, countersigned by the owner authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed. Should a claim for extra compensation by the contractor be denied by the designer or the owner, the contractor may pursue his claim in accordance with G.S. 143-135.3.

In the event of emergency endangering life or property, the contractor may be directed to proceed on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the designer or owner, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.

- c. In determining the values of changes, either additive or deductive, contractors are restricted to the use of the following methods:
1. Where the extra work involved is covered by unit prices quoted in the proposal, or subsequently agreed to by the Contractor, Designer, Owner and State Construction Office the value of the change shall be computed by application of unit prices based on quantities, estimated or actual as agreed of the items involved, except in such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or more. In such cases, either party may elect to proceed under subparagraph c (2) herein. If neither party elects to proceed under c (2), then unit prices shall apply.
  2. The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.
- d. Under Paragraph "b" and Methods "c(2)" above, the allowances for overhead and profit combined shall be as follows: all contractors (the single contracting entity (prime), his subcontractors (1<sup>st</sup> tier subs), or their sub-subcontractors (2<sup>nd</sup> tier subs, 3<sup>rd</sup> tier subs, etc.) shall be allowed a maximum of 10% on work they each self-perform; the prime contractor shall be allowed a maximum of 5% on contracted work of his 1<sup>st</sup> tier sub; 1<sup>st</sup> tier, 2<sup>nd</sup> tier, 3<sup>rd</sup> tier, etc. contractors shall be allowed a maximum of 2.5% on the contracted work of their subs. ; Under Method "c(1)", no additional allowances shall be made for overhead and profit. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%) profit, but no allowances for overhead.
- e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:
1. The actual costs of materials and supplies incorporated or consumed as part of the work;
  2. The actual costs of labor expended on the project site; labor expended in coordination, change order negotiation, record document maintenance, shop drawing revision or other tasks necessary to the administration of the project are considered overhead whether they take place in an office or on the project site.
  3. The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions; worker's compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;
  4. The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the work;
  5. The actual costs of premiums for bonds, insurance, permit fees and sales or use taxes related to the work.
- Overtime and extra pay for holidays and weekends may be a cost item only to the extent approved by the owner.
- f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change shall be arrived at by one of the foregoing methods.

All change orders shall be supported by a unit cost breakdown showing method of arriving at net cost as defined above.

- g. Change orders shall be submitted by the contractor in writing to the owner/designer for review and approval. The contractor will provide such proposal and supporting data in suitable format. The designer shall verify correctness. Delay in the processing of the change order due to lack of proper submittal by the contractor of all required supporting data shall not constitute grounds for a time extension or basis of a claim. Within fourteen (14) days after receipt of the contractor's accepted proposal including all supporting documentation required by the designer, the designer shall prepare the change order and forward to the contractor for his signature or otherwise respond, in writing, to the contractor's proposal. Within seven (7) days after receipt of the change order executed by the contractor, the designer shall, certify the change order by his signature, and forward the change order and all supporting data to the owner for the owner's signature. The owner shall execute the change order, within seven (7) days of receipt.

At the time of signing a change order, the contractor shall be required to certify as follows:

"I certify that my bonding company will be notified forthwith that my contract has been changed by the amount of this change order, and that a copy of the approved change order will be mailed upon receipt by me to my surety."

- h. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.
- i. If, during the progress of the work, the owner requests a change order and the contractor's terms are unacceptable, the owner, may require the contractor to perform such work on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the Designer or owner, a correct account of cost together with all proper invoices, payrolls and supporting data. Upon completion of the work a change order will be prepared with allowances for overhead and profit per paragraph d. above and "net cost" and "cost" per paragraph e. above. Without prejudice, nothing in this paragraph shall preclude the owner from performing or to have performed that portion of the work requested in the change order.

#### **14. ANNULMENT OF CONTRACT**

If the contractor fails to begin the work under the contract within the time specified, or the progress of the work is not maintained on schedule, or the work is not completed within the time specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the contractor shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the owner may give notice in writing, sent by certified mail, return receipt requested, to the contractor and his surety (if applicable) of such delay, neglect or default, specifying the same, and if the contractor within a period of seven (7) days after such notice shall not proceed in accordance therewith, then the owner shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the contractor, or the surety (if applicable) shall fail to take over the work to be done under this contract within seven (7) days after being so notified and notify the owner in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the owner shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said contractor, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the owner, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said contractor and surety (if applicable). In case the expense so incurred by the owner shall be less than the sum which would have been payable under the contract, if it had been completed by said contractor, then the said contractor and surety (if applicable) shall be entitled to receive the difference, but in case such expense shall exceed the sum which would



have been payable under the contract, then the contractor and the surety (if applicable) shall be liable and shall pay to the owner the amount of said excess.

## **15. TERMINATION FOR CONVENIENCE**

- a. Owner may at any time and for any reason terminate Contractor's services and work at Owner's convenience, after notification to the contractor in writing via certified mail. Upon receipt of such notice, Contractor shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.
- b. Upon such termination, Contractor shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by Contractor as approved by Owner; (3) plus ten percent (10%) of the cost of the balance of the work to be completed for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to Contractor prior to the date of the termination of this Agreement. Contractor shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

## **16. OWNER'S RIGHT TO DO WORK**

If, during the progress of the work or during the period of guarantee, the contractor fails to prosecute the work properly or to perform any provision of the contract, the owner, after seven (7) days' written notice sent by certified mail, return receipt requested, to the contractor from the designer, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the contractor, such action and cost of same having been first approved by the designer. Should the cost of such action of the owner exceed the amount due or to become due the contractor, then the contractor or his surety, or both, shall be liable for and shall pay to the owner the amount of said excess.

## **17. REQUESTS FOR PAYMENT**

Contractor shall refer to the Supplemental General Conditions for specific directions on payment schedule, procedures and the name and address where to send applications for payments for this project. It is imperative that invoices be sent only to the above address in order to assure proper and timely delivery and handling.

The Designer/Owner will process all Contractor pay requests as the project progresses. The Contractor shall receive payment within thirty (30) consecutive days after Designer/Owner's approval of each pay request. Payment will only be made for work performed as determined by the Designer/Owner.

Retainage:

- a. Retainage withheld will not exceed 5% at any time.
- b. The same terms apply to general contractor and subcontractors alike.

Final payment will be made within forty-five (45) consecutive days after acceptance of the work, receipt of marked-up "as-built" drawings and specifications and the submission both of notarized Contractor's affidavit and final pay request. All pay requests shall be submitted to the Designer/Owner for approval.

**THE CONTRACTOR'S FINAL PAYMENT APPLICATION SHALL INCLUDE CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS AND CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS.**

## **18. PAYMENTS WITHHELD**

The designer with the approval of the Owner may withhold payment for the following reasons:

- a. Faulty work not corrected.

- b. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer.
- c. To provide for sufficient contract balance to cover liquidated damages that will be assessed.
- d. The secretary of the Department of Administration may authorize the withholding of payment for the following reasons:
  - i. Claims filed against the contractor or evidence that a claim will be filed.
  - ii. Evidence that subcontractors have not been paid.

When grounds for withholding payments have been removed, payment will be released. Delay of payment due the contractor without cause will make owner liable for payment of interest to the contractor as provided in G.S. 143-134.1. As provided in G.S. 143-134.1(e), the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

## 19. MINIMUM INSURANCE REQUIREMENTS

The work under this contract shall not commence until the contractor has obtained all required insurance and verifying certificates of insurance have been approved in writing by the owner. These certificates shall document that coverages afforded under the policies will not be cancelled, reduced in amount or coverages eliminated until at least thirty (30) days after mailing written notice, by certified mail, return receipt requested, to the insured and the owner of such alteration or cancellation. If endorsements are needed to comply with the notification or other requirements of this article copies of the endorsements shall be submitted with the certificates.

### a. **Worker's Compensation and Employer's Liability**

The contractor shall provide and maintain, until final acceptance, workmen's compensation insurance, as required by law, as well as employer's liability coverage with minimum limits of \$100,000.

### b. **Public Liability and Property Damage**

The contractor shall provide and maintain, until final acceptance, comprehensive general liability insurance, including coverage for premises operations, independent contractors, completed operations, products and contractual exposures, as shall protect such contractors from claims arising out of any bodily injury, including accidental death, as well as from claims for property damages which may arise from operations under this contract, whether such operations be by the contractor or by any subcontractor, or by anyone directly or indirectly employed by either of them and the minimum limits of such insurance shall be as follows:

Bodily Injury:	\$500,000 per occurrence
Property Damage:	\$100,000 per occurrence / \$300,000 aggregate

In lieu of limits listed above, a \$500,000 combined single limit shall satisfy both conditions.

Such coverage for completed operations must be maintained for at least two (2) years following final acceptance of the work performed under the contract.

### c. **Property Insurance (Builder's Risk/Installation Floater)**

The contractor shall purchase and maintain property insurance until final acceptance, upon the entire work at the site to the full insurable value thereof. This insurance shall include the interests of the owner, the contractor, the subcontractors and sub-subcontractors in the work and shall insure against the perils of fire, wind, rain, flood, extended coverage, and vandalism and malicious mischief. If the owner is damaged by failure of the contractor to purchase or maintain such

insurance, then the contractor shall bear all reasonable costs properly attributable thereto; the contractor shall effect and maintain similar property insurance on portions of the work stored off the site when request for payment per articles so includes such portions.

d. **Deductible**

Any deductible, if applicable to loss covered by insurance provided, is to be borne by the contractor.

e. **Other Insurance**

The contractor shall obtain such additional insurance as may be required by the owner or by the General Statutes of North Carolina including motor vehicle insurance, in amounts not less than the statutory limits.

f. **Proof of Carriage**

The contractor shall furnish the owner with satisfactory proof of carriage of the insurance required before written approval is granted by the owner.

## **20. ASSIGNMENT**

No assignment of the Contractor's obligations or the Contractor's right to receive payment hereunder shall be permitted. However, upon written request approved by the Owner and solely as a convenience to the Contractor, the Owner may: (1) forward the Contractor's payment check directly to any person or entity designated by the Contractor, and (2) include any person or entity designated by Contractor as a joint payee on the Contractor's payment check. In no event shall such approval and action obligate the Owner to anyone other than the Contractor, and the Contractor shall remain responsible for fulfillment of all contract obligations.

## **21. CLEANING UP AND RESTORATION OF SITE**

The Contractor shall keep the sites and surrounding area reasonably free from rubbish at all times and shall remove debris from the site from time to time or when directed to do so by the Owner. Before final inspection and acceptance of the project, the Contractor shall thoroughly clean the sites, and completely prepare the project and site for use by the Owner.

At the end of construction, the contractor shall oversee and implement the restoration of the construction site to its original state. Restoration includes but not limited to walks, drives, lawns, trees and shrubs, corridors, stairs and other elements shall be repaired, cleaned or otherwise restored to their original state.

## **22. GUARANTEE**

The contractor shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the final acceptance of the work and shall replace such defective materials or workmanship without cost to the owner.

Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The contractor shall replace such defective equipment or materials, without cost to the owner, within the manufacturer's warranty period.

Additionally, the owner may bring an action for latent defects caused by the negligence of the contractor, which is hidden or not readily apparent to the owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.

Guarantees for roofing workmanship and materials shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

## **23. STANDARDS**

All manufactured items and/or fabricated assemblies subject to operation under pressure, operation by connection to an electric source, or operation involving a connection to a manufactured, natural, or LP gas source shall be constructed and approved in a manner acceptable to the appropriate State inspector which customarily requires the label or re-examination listing or identification marking of appropriate safety standard organization, such as the American Society of Mechanical Engineers for pressure vessels; the Underwriters Laboratories and/or National Electrical Manufacturers Association for electrically operated assemblies; or the American Gas Association for gas operated assemblies, where such approvals of listings have been established for the type of device offered and furnished. Further, all items furnished shall meet all requirements of the Occupational Safety and Health Act (OSHA), and State and federal requirements relating to clean air and water pollution.

All equipment and products must be independent third party tested and labeled (UL, FM, or CTS) before final connections to Owner services or utilities.

## **24. TAXES**

- a. Federal excise taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3442(3)).
- b. Federal transportation taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3475(b) as amended).
- c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into state work and such costs shall be included in the bid proposal and contract sum.
- d. Local option sales and use taxes, as required by law, do apply to materials entering into state work as applicable and such costs shall be included in the bid proposal and contract sum.
- e. **Accounting Procedures for Refund of County Sales & Use Tax**

Amount of county sales and use tax paid per contractor's statements:

Contractors performing contracts for state agencies shall give the state agency for whose project the property was purchased a signed statement containing the information listed in G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement as of April 1, 1991 from the contractor setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax.

Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the contractor.

Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant.

Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials, supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

## **25. EQUAL OPPORTUNITY CLAUSE**

The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the secretary of Labor, are incorporated herein.

The contractor(s) agree not to discriminate against any employee or applicant for employment because of physical or mental disabilities in regard to any position for which the employee or applicant is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals with such disabilities without discrimination based upon their physical or mental disability in all employment practices.

## **26. MINORITY BUSINESS PARTICIPATION**

GS 143-128.2 establishes a ten percent (10%) goal for participation by minority business in total value of work for each State building project.

For construction contracts with a value of less than \$300,000, the Owner has the responsibility to make a good faith effort to solicit minority bids and to attain the goal. The contractor shall include with his bid a completed Identification of HUB Certified/Minority Business Participation form. Contractor shall submit completed Appendix E MBE Documentation for Contract Payments form with final payment request.

For construction contracts with a value of \$300,000 or greater, the contractor shall comply with the document *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Identification of Minority Business Participation, Affidavits A, B, C, and D, and Appendix E. These forms provided herein are hereby incorporated and made a part of this contract.

## **27. ACCESS TO PERSONS AND RECORDS**

The State Auditor shall have access to persons and records as a result of all contracts or grants entered into by the Owner in accordance with General Statute 147-64.7. The Owner's internal auditors shall also have the right to access and copy the Contractor's records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or relating to Contractor's requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions and related claims for delay/extended general conditions costs, claims for lost productivity, claims for lost efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

## **28. GOVERNING LAWS**

This contract is made under and shall be governed by and construed in accordance with the laws of the State of North Carolina. The Contractor shall comply with all applicable federal, State and local laws, statutes, ordinances and regulations including, but not limited to, the Omnibus Transportation Act of 1991 and its implementing regulations.

## **29. CONTRACTOR EVALUATION**

The contractor's overall work performance on the project shall be fairly evaluated in accordance with the State Building Commission policy and procedures, for determining qualifications to bid on future State projects. In addition to final evaluation, an interim evaluation may be prepared during the progress of project. The owner may request the contractor's comments to evaluate the designer.



## **SUPPLEMENTARY GENERAL CONDITIONS**

### **ARTICLE 2**

#### **CONTRACT DOCUMENTS**

**Delete the definition of contract documents and substitute the following:**

**Contract Documents:** “Contract Documents” shall consist of the Notice to Bidders; General Conditions of the Contract; special conditions if applicable; Supplementary General Conditions; the drawings and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the bid; the contract; the performance bond if applicable; and insurance certificates. All of these items together form the contract.

Drawings and Specifications by Bowman Murray Hemingway Architects, PC labeled Coastal Carolina Community College Maintenance Lighting Trail and Infrastructure Project, dated **11/17/2023**

#### **INDEX OF DRAWINGS**

##### **ARCHITECTURAL:**

G1.0 COVER SHEET

##### **ELECTRICAL:**

E-001	ABBREV, LEGEND AND DETAILS
E-002	GENERAL NOTES AND DETAILS
E100	SITE PLANS AND RISER DIAGRAM

Project Manual by Bowman Murray Hemingway Architects, PC and CBHF Engineers dated 11/17/2023

### **ARTICLE 6**

#### **SUBSTITUTIONS**

**Delete Article 6 and substitute with the following:**

In accordance with the provisions of Specification Section 012500, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until ten (10) days prior to the receipt of bids when submitted to the Designer with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

- a. Name, address, and telephone number of manufacturer and supplier as appropriate.
- b. Trade name, model or catalog designation.
- c. Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.
- d. Detailed comparison with specified products including performance capabilities, warranties, and test results.
- e. Other pertinent data including data requested by the Designer to confirm product equality.

- If a proposed material, product, or equipment substitution is deemed equal by the Designer to those specified, all bidders of record will be notified by Addendum.
- f. Contractors shall use the substitution request form included in specification section 012500.

## **ARTICLE 8**

### **Add the following:**

#### **UTILITIES**

A source of connection for power and water will be provided and paid for by the Owner. Coordination and scheduling of any utility work that requires power or water disconnection shall be coordinated with Coastal Carolina Community College.

#### **USE OF PREMISES**

**SITE RESTRICTIONS** – The Contractor shall ensure uninterrupted access and public safety in the area of the jobsite. The Contractor shall conduct his operations in strict compliance with regulations, policies and operating procedures established by the College.

**SANITARY FACILITIES** – The Contractor will provide temporary sanitary facilities for the use of his employees for the contract duration.

#### **NO SMOKING POLICY**

No smoking is permitted on the Coastal Carolina Community College campus.

## **ARTICLE 17**

#### **REQUESTS FOR PAYMENT**

Payment requests shall be made on AIA form G702/G703. See Specification Section 012900 for a summary of all requirements.

## **ARTICLE 24**

#### **TAXES**

### **Add the following:**

The Contractor shall provide the State of North Carolina Sales and Use Tax Report Detail with each pay application. The State of North Carolina County Sales and Use Tax Report Summary Totals and Certification shall be provided with the final pay application. A copy of this document is included in the project manual.



## ARTICLE 30

### PERFORMANCE AND PAYMENT BONDS AND BID BONDS

#### Add the following:

Performance and Payment Bonds are not required for this project.  
Bid Bond is required for this project.

## ARTICLE 31

### TIME OF COMPLETION

The Contractor shall commence work to be performed under this Contract on a date to be specified in written order from the Designer/Owner and shall fully complete all work hereunder within **180** consecutive calendar days from the Notice to Proceed. For each day in excess of the above number of days, the Contractor shall pay the Owner the amount **One Hundred Dollars (\$100.00)** as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner should the Contractor fail to complete the Work within the time specified.

If the Contractor is delayed at any time in the progress of his work by any act or negligence of the Owner, his employees or his separate contractor, by changes ordered in the work; by abnormal weather conditions; by any causes beyond the Contractor's control or by other causes deemed justifiable by Owner, then the contract time may be reasonably extended in a written order from the Owner upon written request from the Contractor within ten days following the cause for delay. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any Contractor claim for compensable damages for delays is limited to delays caused solely by the Owner or its agents.

The Contractor shall provide a construction schedule delineating critical project milestones prior to Notice to Proceed.

### END OF SUPPLEMENTARY GENERAL CONDITIONS







## APPENDIX E

### MBE DOCUMENTATION FOR CONTRACT PAYMENTS

Prime Contractor/Architect: \_\_\_\_\_

Address & Phone: \_\_\_\_\_

Project Name: \_\_\_\_\_

Pay Application #: \_\_\_\_\_ Period: \_\_\_\_\_

The following is a list of payments made to Minority Business Enterprises on this project for the above-mentioned period.

MBE FIRM NAME	* INDICATE TYPE OF MBE	AMOUNT PAID THIS MONTH	TOTAL PAYMENTS TO DATE	TOTAL AMOUNT COMMITTED

\*Minority categories: Black, African American (B), Hispanic (H), Asian American (A), American Indian (I), Female (F), Social and Economically Disadvantage (D)

Date: \_\_\_\_\_ Approved/Certified By: \_\_\_\_\_

Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature

**SUBMIT WITH EACH PAY REQUEST & FINAL PAYMENT**



TO OWNER: PROJECT: FROM CONTRACTOR: VIA ARCHITECT: APPLICATION NO: PERIOD TO: PROJECT NOS: CONTRACT DATE:

Distribution to:  

OWNER

ARCHITECT

CONTRACTOR

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM \$  
2. Net change by Change Orders \$  
3. CONTRACT SUM TO DATE (Line 1 + 2) \$  
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) \$  
5. RETAINAGE:  
a. % of Completed Work (Column D + E - F on G703) \$  
b. % of Stored Material (Column F on G703) \$  
Total Retainage (Lines 5a + 5b or Total in Column I of G703) \$  
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total) \$  
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate) \$  
8. CURRENT PAYMENT DUE \$  
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6) \$

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... \$

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.) ARCHITECT:

By: Date: This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.





## PAGE OF PAGES

APPLICATION NO:

APPLICATION DATE:

APPLICATION DATE:

PERIOD TO:

PERIOD TO:

ARCHITECT'S PROJECT NO:

[illegible]



STATE OF NORTH CAROLINA  
COUNTY SALES AND USE TAX REPORT  
SUMMARY TOTALS AND CERTIFICATION

CONTRACTOR: \_\_\_\_\_ Page 1 of \_\_\_\_\_

PROJECT: \_\_\_\_\_ FOR PERIOD: \_\_\_\_\_

	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL ALL COUNTIES
CONTRACTOR							
SUBCONTRACTOR(S)*							
COUNTY TOTAL							

\* Attach subcontractor(s) report(s)  
\*\* Must balance with Detail Sheet(s)

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the building or structure. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
\_\_\_\_\_  
Signed

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_  
\_\_\_\_\_  
Print or Type Name of Above

Seal  
NOTE:  
This certified statement may be subject to audit.

Page 2 of       Page 2 of       Page 2 of       

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FOR PERIOD:

PURCHASE DATE	VENDOR NAME	INVOICE NUMBER	TYPE OF PROPERTY	INVOICE TOTAL	COUNTY TAX PAID	COUNTY OF SALE *
				\$	\$	
				TOTAL:	\$	

\* If this is an out-of-state vendor, the County of Sale should be the county to which the merchandise was shipped.

## FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS THAT \_\_\_\_\_

\_\_\_\_\_ as  
principal, and \_\_\_\_\_, as surety, who is  
duly licensed to act as surety in North Carolina, are held and firmly bound unto the State of  
North Carolina\* through \_\_\_\_\_ as  
obligee, in the penal sum of \_\_\_\_\_ DOLLARS, lawful money of  
the United States of America, for the payment of which, well and truly to be made, we bind  
ourselves, our heirs, executors, administrators, successors and assigns, jointly and  
severally, firmly by these presents.

Signed, sealed and dated this \_\_\_\_ day of \_\_\_\_ 20\_\_

WHEREAS, the said principal is herewith submitting proposal for  
and the principal desires to file this bid bond in lieu of making  
the cash deposit as required by G.S. 143-129.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such, that  
if the principal shall be awarded the contract for which the bid is submitted and shall  
execute the contract and give bond for the faithful performance thereof within ten days after  
the award of same to the principal, then this obligation shall be null and void; but if the  
principal fails to so execute such contract and give performance bond as required by G.S.  
143-129, the surety shall, upon demand, forthwith pay to the obligee the amount set forth in  
the first paragraph hereof. Provided further, that the bid may be withdrawn as provided by  
G.S. 143-129.1

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)



**SECTION 316**

CONTRACTOR'S

AFFIDAVIT OF

RELEASE OF LIENS

Owner ☐

Designer ☐

Contractor ☐ Code \_\_\_\_\_ Item \_\_\_\_\_

Surety ☐

Other ☐

For Use with State of North Carolina Projects

TO: (OWNER)

CONTRACT FOR:

CONTRACT DATE:

PROJECT INFORMATION:  
(Name & Location)

State of:

County of:

The undersigned, pursuant to Article 36 of the General Conditions of the Contract, hereby certifies that to the best of his knowledge, information and belief, the Releases or Waivers of Lien attached hereto include the contractor, all subcontractors, all suppliers of materials and equipment, and all performers of work, labor or services who have or may have liens against any property of the owner arising in any manner out of the performance of the contract referenced above.

SUPPORTING DOCUMENTS

ATTACHED HERETO:

CONTRACTOR:

Address:

By

Subscribed and sworn to before me  
this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

Signature Notary Public:

Printed Name of Notary Public:

My Commission Expires:





## SECTION 011000 - SUMMARY

### PART 1 - GENERAL

#### 1.1 WORK COVERED BY CONTRACT DOCUMENTS:

- A. Project Identification: Project includes the following:
  - 1. Project includes, but is not limited, to the following:
    - a. Provide and install new power source for new maintenance trail area lighting fixtures from existing parking lot loadcenter.
    - b. Provide and install new pole mounted area lighting for the maintenance trail.
    - c. Provide and install new 6 strand multimode fiber optic cable from the existing emergency phone pedestal to the existing Annex building.
    - d. Provide and install new CAT6A cables from new equipment enclosure to existing emergency telephone pedestal and new area lighting poles, for Owner provided and Contractor installed CCTV cameras.
    - e. Provide and install new equipment enclosure and support structure.
    - f. Provide and install new power source for new equipment enclosure from existing parking lot loadcenter.
  - 2. Project Location: Jacksonville, North Carolina
  - 3. Owner: Coastal Carolina Community College
- B. Architect Identification: The Project Contract Documents, dated 11-17-23, were prepared for Coastal Carolina Community College by Bowman Murray Hemingway Architects, PC, 514 Market Street, Wilmington, NC 28401.
- C. The contract documents for this project include the following:
  - 1. Specifications – Architectural & Electrical.
  - 2. Drawings – Architectural & Electrical.

#### 1.2 USE OF PREMISES

- A. General: The Contractor shall coordinate use of the work area and parking areas with the Owner's representative. Contractor staging area and project deliveries routing to be coordinated with the Owner's representative.
- B. Working Hours: Normal working hours shall be as follows: For work taking place within the school building, the normal working period shall be from 7:30 a.m. to 5:00 p.m. (Monday-Friday) five days per week. Work may be performed and may be required to be performed at other times with the consent of the Owner's representative and the Project Manager in order to accommodate students' needs. Work that interrupts students' needs will be stopped upon project manager(s)' request. The College's class schedule will not be modified for this project. Prearranged work may extend beyond the normal work hours. All work must comply with the local noise ordinance.

- C. Site Conditions: Prior to beginning work, the Contractor shall coordinate a site walk-through with the Owner's Representative to determine the condition of sidewalks and lawn areas adjacent to the project area. Any areas damaged during construction shall be restored to original condition. This includes, but is not limited to, asphalt and concrete repairs, as well as re-grading and seeding of lawn areas.

1.3 PROJECT SIGN: NOT REQUIRED.

END OF SECTION 011000

## SECTION 012500-PRODUCT SUBSTITUTIONS (PRIOR TO BID)

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.
- B. This section is to be used in strict accordance with substitution criteria of Division 01 and limitations to substitution set within individual specification sections.

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made prior to the receipt of bids for the project.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Product Requirements."

#### 1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

- C. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor. The following are considered substitutions:
  - 1. Substitutions requested during bidding and accepted ten (10) days prior to the receipt of Bids for the Project.
  - 2. Revisions to Contract Documents requested by the Owner and/or Architect.
  - 3. Specified options of products and construction methods included in the Contract Documents are no longer or not readily available.
  - 4. Changes required due to compliance with governing regulations and orders issued by governing authorities.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

#### 1.4 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration a minimum of 10 days prior to bid due date. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

#### 1.5 SUBSTITUTION REQUEST FORM: USE FORM PROVIDED AT END OF THIS SECTION.

- A. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
  - 1. Delete requirements below that are unnecessary or included in the Supplementary Conditions. Revise retained subparagraphs to suit Project.
  - 2. Statement indicating why specified material or product cannot be provided.
  - 3. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
  - 4. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  - 5. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - 6. Samples, where applicable or requested.
  - 7. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - 8. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - 9. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

10. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
  11. Cost information, including a proposal of change, if any, in the Contract Sum.
  12. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
  13. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- B. Architect's Action: If necessary the Architect will request additional information or documentation necessary for evaluation of the request. Upon receipt of the request, or receipt of the additional information or documentation, which ever is later, the Architect will evaluate material for acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitution cannot be made or obtained within the time allocated, use the product specified by name. Acceptance of substitution request will be in the form of Addendum.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received a minimum of 10 days prior to the bidding of the project. Requests received after that time may be considered or rejected at the discretion of the Architect.
- B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  2. Requested substitution does not require extensive revisions to the Contract Documents.
  3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  4. Substitution request is fully documented and properly submitted.
  5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  6. Requested substitution has received necessary approvals of authorities having jurisdiction.
  7. Requested substitution is compatible with other portions of the Work.
  8. Requested substitution has been coordinated with other portions of the Work.
  9. Requested substitution provides specified warranty.

- C. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

### PART 3 - EXECUTION (Not Applicable)

- 3.1 Refer to “Substitution Request Form” on the following page.

END OF SECTION 012500

SUBSTITUTION REQUEST FORM (Prior To Receipt Of Bids)    Date: \_\_\_\_\_

Project: \_\_\_\_\_

Location: \_\_\_\_\_ Job No.: \_\_\_\_\_

To: \_\_\_\_\_

(Architect of Record)

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

\_\_\_\_\_

SPECIFIED PRODUCT OR SYSTEM:

Section: \_\_\_\_\_ Name: \_\_\_\_\_

Description: \_\_\_\_\_

SUBSTITUTE PRODUCT OR SYSTEM:

Section: \_\_\_\_\_ Name: \_\_\_\_\_

Description: \_\_\_\_\_

SUBSTITUTION ANALYSIS:

Reason for substitution request: \_\_\_\_\_

\_\_\_\_\_

Substitution affects other materials or systems:   YES \_\_\_   NO \_\_\_\_\_   If YES, attach complete data.

The following data is furnished herewith for evaluation of the substitution:

\_\_\_\_\_ Catalog    \_\_\_\_\_ Drawings    \_\_\_\_\_ Samples    \_\_\_\_\_ Test Reports

Other: \_\_\_\_\_

THE UNDERSIGNED HEREBY CERTIFIES THAT THIS SUBMITTAL HAS BEEN FULLY CHECKED  
AND COORDINATED WITH THE CONTRACT DOCUMENTS.

From: \_\_\_\_\_

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

\_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Signed: \_\_\_\_\_





## SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

#### 1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Architect's Supplemental Instructions.

#### 1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 5 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include requests for an extension of contract time, if required, in the proposal.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

END OF SECTION 012600

## SECTION 012900 - PAYMENT PROCEDURES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

#### 1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values (AIA G-702 & 703) with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets.
  - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  - 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section.
    - b. Description of the Work – broken down into material and labor.
    - c. Change Orders (numbers) that affect value.
    - d. Dollar value.
      - 1. Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the Schedule of Values for initial cost of materials and labor, for each subsequent stage of completion, and for total installed value of that part of the Work. Submit sample to architect for approval.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### 1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Final Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- D. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Agency, Owner and Contractor on Change Order Form.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

- F. Retainage payment will be made on the basis of 95% of monthly estimates and final payment final payment made upon completion and acceptance of the work. Retainage will not exceed 5% at any time.
- G. Transmittal: Submit 5 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of Values.
  - 3. Contractor's Construction Schedule (preliminary if not final).
  - 4. Submittals Schedule (preliminary if not final).
  - 5. List of Contractor's staff assignments.
  - 6. Copies of building permits.
  - 7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  - 8. Certificates of insurance and insurance policies.
  - 9. Performance and payment bonds.
- I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Evidence of completion of Project closeout requirements.
  - 2. Updated final statement, accounting for final changes to the Contract Sum.
  - 3. AIA Document G706A, "Contractor's Affidavit of Release of Liens."

#### 1.4 DOCUMENTS REQUIRED FOR CLOSE OUT OF PROJECTS

Unless specifically noted, TWO copies of all required.

##### A. WARRANTIES AND GUARANTEES REQUIRED BY THE CONTRACT

- 1. General Contract:
  - a. Contractor's warranty letter guaranteeing their work for a period of one year from the date of final inspection.
  - b. Contractor's Affidavit of Payment of Debts and Claims
  - c. Contractor's Affidavit of Release of Liens
  - d. Consent of Surety to final payment.
  - e. Warranties required by other sections within the Project Manual.
  - f. Proof of transfer of attic stock to Owner.

2. Electrical Contract

- a. Contractors warranty letter guaranteeing their work for a period of one year from the date of acceptance by the Owner.
- b. Manufacturer's warranties for specific electrical equipment. (Include in electrical O&M manual.)

B. CERTIFICATES OF AGENCIES REQUIRED BY STATE LAW

- 1. Fire alarm systems record of completion (certification) as required by NFPA 72 (where applicable).

C. LIST OF SUBCONTRACTORS / MATERIAL SUPPLIERS, ETC.

- 1. A listing (which includes names, addresses and phone numbers) of subcontractors and material suppliers involved from Prime through second tier subcontractors and the area of construction in which they did work.

D. OPERATION & MAINTENANCE MANUALS (2 copies)

- 1. Operations and maintenance manual for each piece of equipment provided under your contract. These to be bound and indexed in a titled binder.

E. AS-BUILT DRAWINGS (one copy required) (SEE SECTION 017700 CLOSEOUT PROCEDURES).

F. ITEMS A, B, AND C TO BE BOUND AND INDEXED IN A TITLED BINDER.

END OF SECTION 012900

## SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General Project coordination procedures.
  - 2. Coordination Drawings.
  - 3. Project meetings.

#### 1.2 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.

#### 1.3 PROJECT MEETINGS

- A. General: The Architect will schedule and conduct meetings and conferences at Project site.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Meeting dates and times will be scheduled at the Preconstruction Conference.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Designer records and distributes the final monthly progress meeting minutes to Owner and Contractor.
- B. Preconstruction Conference: The Architect will schedule a preconstruction conference before starting construction, at a time convenient to Owner and General Contractor, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
  - a. Tentative construction schedule.
  - b. Phasing.
  - c. Critical work sequencing.
  - d. Designation of responsible personnel.
  - e. Procedures for processing field decisions and Change Orders.
  - f. Procedures for processing Applications for Payment.
  - g. Distribution of the Contract Documents.
  - h. Submittal procedures.
  - i. Preparation of Record Documents.
  - j. Use of the premises.
  - k. Responsibility for temporary facilities and controls.
  - l. Parking availability.
  - m. Office, work, and storage areas.
  - n. Equipment deliveries and priorities.
  - o. First aid.
  - p. Security.
  - q. Progress cleaning.
  - r. Working hours.

C. The Architect will schedule Progress Meetings: Conduct progress meetings at monthly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - b. Review present and future needs of each entity present, including the following:



- 1) Interface requirements.
  - 2) Sequence of operations.
  - 3) Status of submittals.
  - 4) Deliveries.
  - 5) Off-site fabrication.
  - 6) Access.
  - 7) Site utilization.
  - 8) Temporary facilities and controls.
  - 9) Work hours.
  - 10) Hazards and risks.
  - 11) Progress cleaning.
  - 12) Quality and work standards.
  - 13) Change Orders.
  - 14) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

END OF SECTION 013100



## SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Submittals Schedule.
  - 2. See Division 1 Section "Project Management and Coordination" for Project Schedules and Reporting.
- B. See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

#### 1.2 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - 2. Specification Section number and title.
  - 3. Submittal category (action or informational).
  - 4. Name of subcontractor.
  - 5. Description of the Work covered.
  - 6. Scheduled date for Architect's final release or approval.

### PART 2 - PRODUCTS

#### 2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
  - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
  - 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

END OF SECTION 013200



## SECTION 013300 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. See Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
- C. See Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

#### 1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

#### 1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.
  - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with

- subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Allow 15 days for processing each resubmittal.
  4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Prime Contractor.
    - d. Name, phone number and address of subcontractor or supplier.
    - e. Unique identifier, including revision number.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals received from sources other than Contractor.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

## PART 2 - PRODUCTS

### 2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submittals may be submitted electronically.

- B. **Product Data:** Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Manufacturer's catalog cuts.
    - e. Wiring diagrams showing factory-installed wiring.
    - f. Printed performance curves.
    - g. Operational range diagrams.
    - h. Compliance with recognized trade association standards.
    - i. Compliance with recognized testing agency standards.
- C. **Shop Drawings:** Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. **Preparation:** Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    - f. Shopwork manufacturing instructions.
    - g. Templates and patterns.
    - h. Schedules.
    - i. Notation of coordination requirements.
    - j. Notation of dimensions established by field measurement.
  2. **Wiring Diagrams:** Differentiate between manufacturer-installed and field-installed wiring.
  3. **Sheet Size:** Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
- D. **Samples:** Prepare physical units of materials or products, including the following:
1. **Samples for Initial Selection:** Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Submit three full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
  3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side.
  4. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
  5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- E. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- F. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."
- G. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.



### 3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
  - 1. Approved.
  - 2. Approved as noted.
  - 3. Rejected/Resubmit.

END OF SECTION 013300



## SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

#### 1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

#### 1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing and inspecting agencies, and personnel of authorities having jurisdiction.
- B. Water Service: Use water from Owner's existing water system without metering and without payment of use charges. Coordinate with Owner's representative.
- A. Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges. Coordinate with Owner's representative.

#### 1.4 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
  - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

#### 1.5 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.
  - 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
  - 1. Keep temporary services and facilities clean and neat.
  - 2. Relocate temporary services and facilities as required by progress of the Work.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Safety Fencing: 4' high, orange safety plastic mesh fencing shall be required to define area of work.
- C. Tarpaulin and Plastic Sheeting: Fire-resistive labeled with flame-spread rating of 15 or less as necessary to protect interior space outside of area of work.
- B. Water: Potable.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
  - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- B. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- C. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water, drinking-water units, including paper cup supply.
- D. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- E. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Connect to existing services as approved by Coastal Carolina Community College. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with Facilities Department recommendations.
  - 1. Arrange with Owner and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. Prior to Final Acceptance, restore these facilities to condition existing before initial use.
  - 1. Provide rubber hoses as necessary to serve Project site.
  - 2. Routinely wet grounds and demolition areas to retard airborne dust.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
  - 2. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
  - 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.
- I. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Provide separate telephone capabilities for each field office and first-aid station.
  - 1. Provide additional telephone capabilities for the following:
    - a. Provide a portable cellular telephone for superintendent's use in making and receiving telephone calls when away from field office.
  - 2. At each telephone, post a list of important telephone numbers, including police and fire departments, ambulance service, Contractor's home office, Architect's office, Engineers' offices, Owner's office, and principal subcontractors' field and home offices.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Locate storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
  - 2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
- B. Project Identification and Temporary Signs: Prepare temporary signs to provide directional information to construction personnel and visitors as necessary.
  - 1. Prepare temporary signs to provide directional information to inform public and persons seeking entrance to existing building.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division I Section "Execution Requirements " for progress cleaning requirements.
  - 1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.

2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.
- D. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.
  - E. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. **Ensure all materials and vehicles on project site are secure.**
- C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- D. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
    - a. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
  4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

- E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  - 2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
  - 3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
  - 4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. Prior to Final Acceptance, clean and renovate permanent facilities used during construction period.

### 3.6 EMERGENCIES

- A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

END OF SECTION 015000



## SECTION 017300 - EXECUTION REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Field engineering and surveying.
  - 2. General installation of products.
  - 3. Progress cleaning.
  - 4. Starting and adjusting.
  - 5. Protection of installed construction.
  - 6. Correction of the Work.
- B. See Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

### 3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
  1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  2. Allow for building movement, including thermal expansion and contraction.

- F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.4 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- E. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- G. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- H. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.5 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Final Acceptance.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.7 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

## SECTION 017310 - CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See Divisions 2 through 23 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

#### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as

possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

END OF SECTION 017310





## SECTION 017700 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Project Record Documents.
  - 3. As-Built Survey and Site Plan.
  - 4. Operation and maintenance manuals.
  - 5. Warranties.
  - 6. Instruction of Owner's personnel.
  - 7. Final cleaning.
- B. See Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
- C. See Divisions 2 through 23 Sections for specific closeout and special cleaning requirements for products of those Sections.

#### 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Final Acceptance, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 4. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 5. Complete startup testing of systems.
  - 6. Submit test adjust balance records.
  - 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 8. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  - 9. Complete final cleaning requirements, including touchup painting.
  - 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

### 1.3 FINAL COMPLETION

- A. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit two copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

### 1.5 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
  - 1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
  - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
  - 3. Note Architectural Supplemental Instruction numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
  - 4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Provide to Architect.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Provide to Architect.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Note related Change Orders and Record Drawings, where applicable.
- D. From the contractor's Record Drawings and Specifications furnished to the Architect, the Architect will provide the Owner with Final Electronic Record Documents.
- E. As-Built Survey and Site Plan:
1. The contractor will employ an engineer or land surveyor licensed in the State of North Carolina to provide accurate reproducible as-built drawings to the owner upon completion of construction. Upon checking by the owner any discrepancies will be indicated, then these plans shall be returned to the contractor for correction prior to final payment and final inspection (as applicable).
  2. Payment: No separate payment will be made for as-built drawings. All costs incurred by the contractor for this work should be included in the unit price or lump sum price for the item of work to which it pertains.
    - a. The following items shall be surveyed for as-built condition (as applicable):
    - b. Stormwater Pond: Survey shall contain pond bottom elevation, outlet structure, elevation contours above normal pool.
    - c. Water System: Horizontal location of waterline.
    - d. Sewer System: Horizontal location of sewer pipe and manholes and invert elevations of sewer within each manhole.
    - e. HVAC Piping: Horizontal location of underground HVAC piping.

## 1.6 OPERATION AND MAINTENANCE MANUALS

- A. Assemble two complete sets of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
  2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

## 1.7 WARRANTIES

- A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper. Provide two copies.
  - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Provide instructors experienced in operation and maintenance procedures.
  - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
  - 3. Schedule training with Owner, through Architect, with at least seven days advance notice.

### 3.2 FINAL CLEANING

- A. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
- b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
- c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- g. Sweep concrete floors broom-clean in unoccupied spaces.
- h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- j. Remove labels that are not permanent.
- k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Replace parts subject to unusual operating conditions.
- n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- q. Replace all worn, warped, or marred pier deck or railing components.
- r. Leave Project clean and ready for occupancy.

- B. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

END OF SECTION 017700

## SECTIONS 260000 & 270000 – ELECTRICAL & COMMUNICATIONS

Electrical work shall be defined by drawings numbered with the prefix “E-“, the general provision of the Contract including General Conditions and Supplementary Conditions, Division 1 Specification sections, and Divisions-26 Electrical and 27 Communications Specifications.

Engineer of Record for Divisions 26 & 27 is W. Allen Cribb, PE, CBHF Engineers, PLLC, 2246 Yaupon Drive, Wilmington, NC 28401.



*W. Allen Cribb*

11/17/23





## SECTION 260500 - GENERAL ELECTRICAL

### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK

- A. The Instructions to Bidders, General Conditions of the Contract, Supplementary General Conditions and Division 1 bound herewith are a component part of this Division of the specifications and shall apply to this Division with equal force and shall be consulted in detail for instructions pertaining to the work.
- B. Furnish all labor, materials and equipment and incidentals required to make ready for use complete electrical systems as shown on the Drawings and specified herein.
- C. It is the intent of these Specifications that the electrical systems shall be suitable in every way for the service required. All material and all work which may be reasonably implied as being incidental to the work of this Division shall be furnished at no extra cost.
- D. The work shall include, but not be limited to, furnishing, coordinating, and installing the following:
  - 1. Underground electrical for site lighting.
  - 2. Electrical distribution system for power, lighting, receptacles and miscellaneous power as shown on the contract drawings.
  - 3. Electrical lighting systems as shown on the contract drawings, complete with indicated circuiting, etc.
  - 4. Cabling, raceway and outlet systems for telecommunications, data, fiber and other special systems.
  - 5. Grounding.
  - 6. Other special requirements and/or systems where shown.
- E. Each bidder (or Representative) shall, before preparing a proposal, visit all areas of the existing site. If the work includes demolition, restoration, renovation and/or addition; then existing buildings and structures should be carefully inspected. The submission of the proposal by this Bidder shall be considered evidence that the Bidder (or Representative) has visited the site and noted the locations and conditions under which the work will be performed and that the Bidder takes full responsibility for a complete knowledge of all factors governing the work.
- F. All power interruptions to existing equipment shall be at the Owner's convenience with 24 hours (minimum) notice. Each interruption shall have prior approval.
- G. The work shall include complete testing of all equipment and wiring at the completion of work and making any minor correction changes or adjustments necessary for all the proper functioning of the system and equipment. All work shall be of the highest quality; substandard work will be rejected.
- H. Field verify all existing underground electrical and mechanical piping.
- I. Field verify and document all existing electrical devices, lighting fixtures, telecom devices (including wireless access points, projectors and smart boards), fire alarm devices, etc. Once

demolition begins, unless brought to the attention of the owner, it is assumed everything is in working order and the contractor is responsible for ensuring everything is in working order upon re-installation.

## 1.2 SUBMITTALS

- A. Shop drawings shall be submitted for all equipment, apparatus, and other items as required by the Architect/Engineer. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Submittals are required for all materials shown in the individual specifications sections.
- C. Submittals are required for materials and specific methods used for penetrations of rated assemblies and for seismic restraints.
- D. Transmit each shop drawing submittal with provided Shop Drawing Submittal Cover Form, attached, for each item of equipment/material or each specification section/paragraph.
- E. All shop drawings and submittals shall be submitted at the same time. Partial shop drawing and submittals will be rejected and not processed. Materials, equipment and long lead items that require special handling, if identified and requested by the contractor, will be processed separately.
- F. Proposed equipment and/or materials substitutions shall be clearly indicated in shop drawings. All deviations from the specified quality, functionality, appearance or performance of the proposed equipment and/or materials shall be clearly summarized in the preface of each submittal.
- G. The project shall be bid based on the equipment listed in these specifications and on the drawings. After award of the Electrical Contract the Contractor may wish to substitute equipment other than that specified, subject to approval. The Electrical Contractor shall bear the "burden of proof" for demonstrating substitute equipment equivalency and suitability.
- H. The Electrical Contractor shall be required to replace installed "equivalent" equipment if the operation of this equipment does not meet the full design intent of the specified system.
- I. Physical size of equipment used in the design layout are those of reputable equipment manufacturers. The Contractor is responsible for providing equipment which will fit the space provided. If the Contractor elects to use other manufacturer's equipment, any resulting conflicts with space clearance or codes shall be the responsibility of the Contractor to correct at the Contractor's expense.
- J. The Contractor assumes all responsibility for providing code clearances.

## 1.3 COORDINATION OF WORK

- A. It is understood and agreed that the Contractor is, by careful examination, satisfied as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the general and local conditions and all other

matters which can and may affect the work under this contract. The Contractor shall be held responsible for visiting the site and thoroughly familiarizing himself with the existing conditions and also any contractual requirements as may be set forth in the other Divisions of these Specifications. No extras will be considered because of additional work necessitated by obvious job conditions that are not indicated on the drawings.

- B. The Contractor shall compare the electrical drawings and specifications with the drawings and specifications for other trades, and shall report any discrepancies between them to the Architect/Engineer and obtain written instructions for changes necessary in the electrical work. The electrical work shall be installed in cooperation with other trades installing interrelated work. Before installation, the Contractor shall make proper provisions to avoid interferences in a manner approved by the Architect/Engineer. All changes required in the work of the Contractor caused by neglect to do so shall be made at the expense of the Contractor.
- C. Location of electrical raceways, switches, panels, equipment, fixtures, etc., shall be adjusted to accommodate the work to interferences anticipated and encountered. The Contractor shall determine the exact route and location of each electrical raceway prior to make up and assembly.
  - 1. Right of Way: Lines which pitch shall have the right of way over those which do not pitch. For example, steam, condensate and plumbing drains shall normally have right of way. Lines whose elevations cannot be changed shall have the right of way over lines whose elevations can be changed.
  - 2. Offsets and changes in direction of electrical raceways shall be made as required to maintain proper headroom and to clear pitched lines whether or not indicated on the drawings. The Contractor shall furnish and install elbows, pull boxes, etc., as required to affect these offsets, transitions, and changes in directions. Conflicts between electrical raceways, fixtures, etc., and ductwork or piping which cannot be resolved otherwise, will be resolved by the Architect/Engineer.
- D. Installation and Arrangements: The Contractor shall install all electrical work to permit removal (without damage to other parts) of any equipment requiring periodic replacement or maintenance. The Contractor shall arrange electrical raceways and equipment to permit ready access to valves, cocks, traps, starters, motors, control components, etc., and to clear the opening of swinging and overhead doors and of access panels.

#### 1.4 EQUIPMENT AND MATERIALS (GENERAL)

- A. In compliance with North Carolina General Statute 133.3, the Architect/Engineer has, wherever possible, specified the required performance and design characteristics of all materials utilized in this construction. In some cases it is impossible to specify the required performance and design characteristics and when this occurs the Architect/Engineer has specified three or more examples of equal design or equivalent design, establishing an acceptable range for items of equal or equivalent design. Cited examples are used only to denote the quality standard of product desired and do not restrict bidders to a specific brand, make, manufacturer or specific name and are used only to set forth and convey to bidders the general style, type, character and quality of product desired. Equivalent products will be acceptable.
- B. Substitution of materials, items, or equipment of equal or equivalent design shall be submitted to the Architect/Engineer for approval or disapproval. Equal or equivalent shall be interpreted to mean an item of material or equipment, similar to that named and which is suitable for the

same use and capable of performing the same functions as that named, the Architect/Engineer being the judge of equality.

- C. The materials used in all systems shall be new, unused and as hereinafter specified and shall bear the manufacturer's name, trade name and third party testing agency label in every case where a standard has been established for the particular material. Equipment furnished under this specification shall be essentially the standard product of manufacturers regularly engaged in the production of the required type of equipment, and shall be the manufacturer's latest approved design. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or manufacturer's specifications shall be submitted for approval as required by the Architect/Engineer.
- D. Protection: Electrical equipment shall at all times during construction be adequately protected against damage. Equipment shall be tightly covered and protected against dirt, water and chemical or mechanical injury and theft. Electrical equipment shall not be stored out of doors. Electrical equipment shall be stored in dry, permanent shelters. If an apparatus has been damaged, such damage shall be repaired at no additional cost. If any apparatus has been subject to possible injury by water, it shall be replaced at no additional cost to the Owner. At the completion of the work, fixtures, equipment, and materials shall be cleaned and polished thoroughly and turned over to the Owner in a condition satisfactory to the Architect/Engineer. Damage or defects, developing before acceptance of the work shall be made good at the Contractor's expense.
- E. Any damage to factory applied paint finish shall be repaired using touch up paint furnished by the equipment manufacturer. The entire damaged panel or section shall be repainted per the field painting specifications in Division 9, at no additional cost to the Owner.
- F. Where materials such as wiring devices and plates, fire alarm equipment, paging system components, etc. are specified to match existing, provide materials to match existing equipment in finish, color, capacity, ratings, operating characteristics, performance, etc.
- G. Delivery and Storage: Equipment and materials shall be delivered to the site and stored in original containers, suitably sheltered from the elements, but readily accessible for inspection by the Architect/Engineer until installed.
- H. Equipment and materials of the same general type shall be of the same make throughout the work to provide uniform appearance, operation and maintenance.
- I. Manufacturer's directions shall be followed completely in the delivery, storage, protection, and installation of all equipment and materials. The Contractor shall promptly notify the Architect/Engineer, in writing, of any conflicts between any requirements of the Contract Documents and the manufacturer's directions and shall obtain the Architect/Engineer's written instructions before proceeding with the work. Should the Contractor perform any work that does not comply with the manufacturer's direction or such written instructions from the Architect/Engineer, the Contractor shall bear all costs arising in correcting the deficiencies.

## 1.5 OPERATION AND MAINTENANCE MANUALS

- A. Submit under relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.

- B. The Contractor shall provide two compilations of catalog data, bound in suitable loose leaf binders, for each manufactured item of equipment used in the electrical work. These shall be presented to the Architect/Engineer for transmittal to the Owner before the final inspection is made. Data shall include printed installation, operation and maintenance instructions for each item, indexed by product with heavy sheet dividers and tabs. All warranties shall be included with each item. Each manufacturer's name, address and telephone number shall be clearly indicated.
- C. Shop drawings with Architect/Engineer's "as noted" markings are not acceptable for the above. "Approved" shop drawings are acceptable if adequate information is contained therein. Generally, shop drawings alone are not adequate.

#### 1.6 PAINTING

- A. All painting will be performed by the General Contractor for the project, unless specifically indicated otherwise.
- B. The Electrical Contractor shall clean all exposed electrical work for painting. Should the Electrical Contractor delay in installing exposed conduit and outlets until the General Contractor has begun painting, the Electrical Contractor shall be required to paint all exposed electrical work at the Electrical Contractor's own expense. Such painting will be accomplished in accordance with the detailed specifications for the Project.
- C. Conductors exposed in boxes and cabinets shall be protected against painting. Devices, cover plates, trims, etc., for panel boards and cabinets shall not be installed until painting has been completed.
- D. The Electrical Contractor shall be responsible for touch up painting that may be required for electrical material or apparatus furnished with factory applied finish.

#### 1.7 LOCATIONS AND MEASUREMENTS

- A. Outlets and appliances are shown and located on the drawings as accurately as possible. All measurements shall be verified on the project and in all cases the work shall suit the surrounding trim, finishes and/or construction. The locations of outlets for special appliances shall be installed so that when extended, they are flush with the finished wall or ceiling and permit the proper installation of fixtures and/or devices. Heights of all outlets shown on the drawings are approximate only. Slight relocations of outlets, devices and equipment shall be made by the Contractor as required or as directed by the Architect/Engineer at no additional cost to the Owner.

#### 1.8 QUALITY OF WORK

- A. All work shall be executed as required by these specifications and the accompanying drawings and shall be done by skilled mechanics, and shall present a neat, trim, and mechanical appearance when completed. All work shall be performed as required by the progress of the job.

## 1.9 SUPERVISION

- A. The Contractor shall personally, or through an authorized and competent representative, constantly supervise the work from the beginning to completion and final acceptance. So far as possible, the Contractor shall keep the same foreman and mechanics throughout the project duration.
- B. During the progress of the work it shall be subject to inspection by representatives of the Architect/Engineer, the Owner, and local inspection authorities, at which time the Contractor shall furnish such required information and data on the project as requested.
- C. The Electrical Contractor shall coordinate the electrical work with other Contractors and cooperate in the preparation and maintenance of a master schedule for the completion of the project.

## 1.10 CLOSING IN WORK

- A. Work shall not be covered up or enclosed until it has been inspected, tested and approved by the authorities having jurisdiction over this work. Should any of the work be enclosed or covered up before such inspection and test, the Contractor shall uncover the work at the Contractor's expense; after it has been inspected, tested and approved, the Contractor shall restore the work to its original condition. The State Electrical Inspector at the State Construction Office shall be called for all inspections at 984-236-5414. Inspections shall be limited to Monday thru Friday unless specifically authorized by State Construction Office.

## 1.11 REFERENCE STANDARDS

- A. All electrical equipment, materials, and installation shall be in accordance with the latest edition of the following codes and standards:
  - 1. American Association of Edison Illuminating Companies (AEIC)
  - 2. American National Standards Institute (ANSI)
  - 3. American Society for Testing and Materials (ASTM)
  - 4. Building Officials Code Administrators (BOCA)
  - 5. Institute of Electrical and Electronic Engineers (IEEE)
  - 6. Insulated Cable Engineers Association (ICEA)
  - 7. International Code Council (ICC)
  - 8. International Conference of Building Officials (ICBO)
  - 9. National Electrical Code (NEC) 2020 edition
  - 10. National Electrical Contractor's Association (NECA)
  - 11. National Electrical Installation Standards (NEIS)
  - 12. National Electrical Manufacturer's Association (NEMA)
  - 13. National Electrical Safety Code (NESC)
  - 14. National Fire Protection Association (NFPA)
  - 15. North Carolina Energy Conservation Code, 2012 (NCECC)
  - 16. North Carolina State Building Code (NCSBC)
  - 17. North Carolina Construction Manual with GS as listed (NCCM)
  - 18. North Carolina State Construction Office Electrical Guidelines and Policies, 2020 Edition
  - 19. Occupational Safety and Health Act (OSHA)
  - 20. Requirements of the Americans with Disabilities Act (ADA), latest edition.

21. Underwriters Laboratories Inc (U.L.)
22. Southern Building Code Congress International (SBCCI)
23. Toxicity Characteristics Leaching Procedure (TCLP)

- B. All electrical equipment and material shall be listed by an approved third party testing agency approved by the NCBCC and shall bear the appropriate testing agency's listing mark or classification marking. Equipment, materials, etc. utilized not bearing a third party testing agency certification shall be field or factory third party testing agency certified prior to equipment acceptance and use.
- C. Where reference is made to one of the above standards, the revision in effect at the time of the bid opening shall apply.

#### 1.12 ENCLOSURE TYPES

- A. Unless otherwise specified herein or shown on the Drawings, electrical enclosures shall have the following ratings:
  1. NEMA 4X for locations subject to corrosion when specifically noted.

#### 1.13 CODES, INSPECTION AND FEES

- A. All equipment, materials and installation shall be in accordance with the requirements of the local authority having jurisdiction.
- B. The Electrical Contractor shall obtain all necessary permits and pay all fees required for permits and inspections of electrical work.
- C. The electrical contractor shall notify the State Electrical Inspectors in the State Construction Office to schedule required inspections. No work will be covered up until after inspection has been completed and approved by authorized SCO inspector.

#### 1.14 CORROSION PROTECTION

All equipment and hardware subject to exposure to the elements and/or not installed in a conditioned space shall be fabricated of non-metallic materials, hot dip galvanized after fabrication or stainless steel. The requirements of preceding section entitled "Delivery and Storage" shall be strictly followed. Touch up any scratched metallic surfaces immediately to prevent corrosion. Apply cold galvanizing compound to all galvanized surfaces damaged during installation, i.e., cutting, etc. Ferrous, rusted or corroded materials shall be replaced before final acceptance of the work.

#### 1.15 TESTS AND SETTINGS

- A. Test all systems furnished under Division 26 and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

- B. Make the following minimum tests and checks prior to energizing electrical equipment:
1. Mechanical inspection, testing and settings of all circuit breakers, disconnect switches, control equipment, etc., for proper operation.
  2. Check all wire and cable terminations. Verify to the Architect/Engineer that connections meet the equipment torque requirements.
  3. Provide all instruments and equipment for the tests specified herein.
- C. All testing shall be scheduled and coordinated by the Contractor. Notify the Owner at least two (2) weeks in advance of conducting tests. The Contractor shall have qualified personnel present during all testing.
- D. All tests shall be completely documented with the time of day, date, temperature, and all other pertinent test information. All required documentation of readings indicated shall be submitted to the Architect/Engineer prior to, and as one of the prerequisites for, final acceptance of the project.
- E. Electrical Distribution System Tests: All current carrying phase conductors and neutrals shall be tested as installed, and before load connections are made, for insulation resistance and accidental grounds. This shall be done with a 500 volt megger. The following procedures shall be as follows:
1. Minimum readings shall be one million (1,000,000) ohms or more for #6 AWG wire and smaller; 250,000 ohms or more for #4 AWG wire or larger. Measurement to be taken between conductors and between conductor and the grounded metal raceway.
  2. After all fixtures, devices and equipment are installed and all connections completed to each panel, the Contractor shall disconnect the neutral feeder conductor from the neutral bar and take a megger reading between the neutral bar and grounded enclosure. If this reading is less than 250,000 ohms, the Contractor shall disconnect the branch circuit neutral wires from this neutral bar. The Contractor shall then test each one separately to the panel until the low reading ones are found. The Contractor shall correct troubles, reconnect and retest until at least 250,000 ohms from the neutral bar to the grounded panel can be achieved with only the neutral feeder disconnected.
  3. The Contractor shall send a letter to the Architect/Engineer, and to the North Carolina State Construction Office certifying that the above has been done and tabulating the megger readings for each panel. This shall be done at least four (4) days prior to final inspection.
  4. At inspection, the Contractor shall furnish a megger and show Architect/Engineer's representative that the panels comply with the above requirements. The Contractor shall also furnish a clamp type ammeter and a voltmeter and take current and voltage readings as directed by the representatives.
  5. At inspection, the Contractor shall furnish ladders, required tools, and mechanics to open fixtures, boxes, panels, or any other equipment to enable the Architect/Engineer's representatives to see into any parts of the installation that may be requested.
- F. Electrical Grounding System Tests: Provide documentation showing values of earth ground impedance for the system ground. See Specifications Section 260526 for testing requirements.
- G. Ground Fault Protection System: Ground fault protection shall be performance tested in the field and properly calibrated and set in accordance with the coordination study. In the absence of a coordination study, set all adjustments to minimum, unless directed otherwise by the Architect/Engineer.



#### 1.16 SLEEVES AND FORMS FOR OPENINGS

- A. Anchor bolts, sleeves, inserts, supports, etc., that may be required for electrical work shall be furnished, located and installed by the Electrical Contractor. The Electrical Contractor shall give sufficient information (marked and located) to the General Contractor in time for proper placement in the construction schedule. Should the Electrical Contractor delay or fail to provide sufficient information in time, then the Electrical Contractor shall cut and patch construction as necessary and required to install electrical work. Such cutting and patching will be done by the General Contractor but paid for by the Electrical Contractor.
- B. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc.
- C. Where exact locations are required by equipment for stubbing up and terminating conduit concealed in floor slabs, request shop drawings, equipment location drawings, foundation drawings, and any other data required to locate the concealed conduit before the floor slab is poured.
- D. Where such data is not available in time to avoid delay in scheduled floor slab pours, the Architect/Engineer may elect to allow the installations of such conduits to be exposed. No additional compensation for such change will be allowed and written approval must be obtained from the Architect/Engineer.
- E. Seal all openings, sleeves, penetration, and slots as specified and as shown on the Contract Drawings.

#### 1.17 CUTTING AND PATCHING

- A. For the purposes of the Electrical Contract, “cutting and patching” shall be defined as that work required to introduce new electrical work into existing construction. Work required to install or fit electrical boxes, conduit, enclosures, equipment, etc. into new construction is not “cutting and patching”.
- B. The Electrical Contractor shall perform all cutting and patching necessary to install all equipment as required under his contract and shall re-establish all finishes to their original condition where cutting and patching occur.
- C. All cutting and patching shall be done in a thoroughly workmanlike manner.
- D. Core drill holes in existing concrete floors and walls as required.
- E. Install work at such time as to require the minimum amount of cutting and patching.
- F. Do not cut joists, beams, girders, columns or any other structural members without first obtaining written permission from the Architect/Engineer.
- G. Cut opening only large enough to allow easy installation of the conduit.
- H. Patching is to be of the same kind of material as was removed.
- I. The completed patching work shall restore the surface to its original appearance.

- J. Patching of waterproofed surfaces shall render the area of the patching completely waterproofed.
- K. Remove rubble and excess patching materials from the premises.
- L. Raceways and ducts penetrating rated floor, ceiling or wall assemblies shall be properly sealed in accordance with the corresponding Underwriters Laboratories approved method utilizing approved and listed materials.

#### 1.18 INTERPRETATION OF DRAWINGS

- A. The Electrical drawings and specifications are complementary each to the other and what may be called for by one shall be as binding as if called for by both. The drawings are diagrammatic and indicate generally the location of outlets, devices, equipment, wiring, etc. Drawings shall be followed as closely as possible; however, all work shall suit the finished surroundings and/or trim.
- B. Do not scale electrical drawings. Field measure for all dimensions.
- C. Where the words “furnish and install” or “provide” are used, it is intended that this contractor shall purchase and install completely any and/or all material necessary and required for this particular item, system, equipment, etc.
- D. Where the words “the Contractor” or “this Contractor” appear in either the Electrical Drawings or Division 26 Specifications, it shall mean the Electrical Contractor.
- E. Any omission from either the drawings or these specifications are unintentional, and it shall be the responsibility of this Contractor to call to the attention of the Architect/Engineer any pertinent omissions before submitting a bid. Complete and working systems are required, whether every small item of material is shown and specified or not.
- F. Where no specific material or equipment type is mentioned, a high quality product of a reputable manufacturer may be used provided it conforms to the requirements of these specifications. These materials shall be listed or labeled by a Third Party Testing Agency accredited by the NCBCC to label electrical equipment.
- G. The electrical drawings show the general arrangement of raceways, equipment, fixtures, and appurtenances and shall be followed as closely as actual building construction and the work of other trades will permit. Some adjustment of routings and installation of conduit, cable tray and devices should be expected. The electrical work shall conform to the requirements shown on all of the drawings. General and Structural drawings shall take precedence over Electrical Drawings. Because of small scale of the electrical drawings, it is not possible to indicate offsets, fittings and accessories which may be required. The Contractor shall investigate the structural and finish conditions affecting the work and shall arrange his work accordingly, providing such fittings and accessories as may be required to meet such conditions, without additional cost to the Owner and as directed by the Architect/Engineer.
- H. Each 3 phase circuit shall be run in a separate conduit unless otherwise shown on the Drawings.

- I. Unless otherwise approved by the Architect/Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
- J. Where circuits are shown as “home runs” all necessary fittings and boxes shall be provided for a complete raceway installation.
- K. Verify with the Architect/Engineer the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.
- L. Any work installed contrary to or without approval by the Architect/Engineer shall be subject to change as directed by the Architect/Engineer, and no extra compensation will be allowed for making these changes.
- M. The locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Architect/Engineer during construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Architect/Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
- N. Surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.
- O. Circuit layouts are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of equipment.
- P. All connections to the equipment shall be made as required, and in accordance with the approved shop and setting drawings.
- Q. Redesign of electrical work, which is required due to the Contractor’s use of an alternate item, arrangement of equipment and/or layout other than specified herein, shall be done by the Contractor at the Contractor’s expense. Redesign and detailed plans shall be submitted to the Architect/Engineer for approval. No additional compensation will be provided for changes in the work, either the Electrical Contractor’s or others, caused by such redesign.
- R. All floor mounted electrical equipment shall be placed on 4 inch thick concrete housekeeping pads. Edges shall be chamfered.

#### 1.19 SIZE OF EQUIPMENT

- A. Investigate each space in the structure through which equipment must pass to reach its final location. If necessary, the manufacturer shall be required to ship his materials in sections sized to permit passing through such restricted areas in the structure.
- B. The equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation, the manufacturer shall be required to suitably brace the equipment, to insure that the tilting does not impair the functional integrity of the equipment.

## 1.20 EXISTING BUILDINGS AND CONSTRUCTION

- A. The Contractor is cautioned that some of the work to be performed under this contract is to be accomplished in an existing occupied building. All such work shall be scheduled and arranged to be done at the convenience of the Owner so as not to interfere with, disrupt, or disturb normal operations in the building. The Contractor shall obtain approval from the Owner before proceeding with work in existing buildings and shall work in existing buildings on schedule as agreed upon with the Owner. This is not to be necessarily construed to mean that the Contractor is expected to perform work on buildings on holidays, weekends, etc., but that the Contractor must schedule work with the Owner for the Owner's beneficial and normal usage of the buildings, and that the Contractor will be required to maintain the schedule as approved by the Owner.
- B. The Contractor shall, at all times, provide safety barriers, protective devices, screening, dust barriers, etc., as required to maintain the safety and comfort of the building's personnel and/or occupants in or near the work area.
- C. The Contractor shall be responsible for cleanup in connection with work in existing buildings. At the end of each working day, all debris, boxes, waste, etc., shall be removed from the buildings and properly disposed of. Equipment, materials, etc., may be left inside the buildings, but such must be properly stored, stacked and located as approved by the Owner.
- D. The Contractor shall do all cutting, patching, finishing, repairing, painting, etc., necessary for electrical work to be installed in existing buildings. All finishes shall be left to equal finish and condition prior to cutting. No cutting of structural members will be allowed. All cutting of walls, floors, roofs, etc., shall be repaired and/or replaced to equal finish prior to cutting. The Contractor shall route conduits and locate equipment as approved by the Owner and Architect/Engineer. Routings and locations shall be firmly established and approved before proceeding with any phase of the work.
- E. The Contractor shall be responsible for any and all damage to the existing buildings, grounds, walkways, paving, etc., caused by the work, the Contractor and/or Contractor's personnel, and/or Contractor's equipment in the accomplishment of this work. Such damages shall be repaired and/or replaced by the Contractor at no additional cost to the Owner, to finish equal to that finish prior to damage. The Architect/Engineer shall be the judge as to equal finishes, etc.

## 1.21 RECORD DRAWINGS

- A. As the work progresses, legibly record all field changes on one set of project contract drawings, herein after called the "record drawings".
- B. Record drawings shall accurately show the installed condition of the following items:
  - 1. Panel schedule(s).
  - 2. Control wiring diagram(s).
  - 3. Lighting fixture schedule(s).
  - 4. Lighting fixture, receptacle, and switch outlets, interconnections and homeruns with circuit identification.

## 1.22 CORROSION PROTECTION

- A. All equipment, raceways, hardware, etc., furnished under the electrical contract shall be protected from corrosion by factory applied coatings, paint and galvanizing, or shall be fabricated of high quality 300 series stainless steel. All exposed hardware shall be hot dip galvanized. The requirements of preceding section entitled "Delivery and Storage" shall be strictly followed. Touch up any scratched metallic surfaces immediately to prevent corrosion. Apply cold galvanizing compound to all galvanized surfaces damaged during installation, i.e., cutting, etc. Rusted or corroded materials shall be replaced before final acceptance of the work.

## 1.23 SEISMIC REQUIREMENTS

- A. All equipment furnished under the electrical contract shall be installed in a manner to be fully compliant with the seismic restraint requirements of the North Carolina State Building Code (NCSBC). The Contractor shall provide any and all seismic restraint details and calculations that may be required by the NCSBC and/or the Authority Having Jurisdiction.
- B. Requirements for restraints are detailed in the NCSBC. All tables and references shall conform to building's location. Restraints shall be per Seismic Performance Category stated on Architectural Drawings.
- C. The Contractor shall retain the services of a Professional Engineer registered in the State of North Carolina to design seismic restraint elements required for this project. The Engineer's calculations, bearing his professional seal, shall accompany shop drawings and shall demonstrate Code compliance including certification that the seismic system components comply with the testing requirements of NCSBC Section 1708.5. Calculations and shop drawings shall be submitted for review prior to the purchasing of materials, equipment, systems and assemblies. Internal seismic restraint elements of manufactured equipment shall be certified by a professional engineer retained by the manufacturer. Such certificate applies only to internal elements of the equipment. All equipment anchorage requirements shall be coordinated with the building structure and shall be compatible thereto. All such anchorages shall be subject to the review and approval of the project's structural engineer
- D. The Professional Engineer retained for seismic restraint calculations shall visit the job site upon completion of the seismic restraint installation to comply with the Special Inspections requirement of the Code. This engineer shall provide written verification of compliance of the installation with the approved seismic submittal. This verification shall be submitted as a Special Inspections Report and shall bear the Engineer's professional seal. Job site inspections by other than this engineer are not acceptable.
- E. Review of the seismic design computations and shop drawings by the Architect/Engineer or his agent shall not relieve the Contractor of his responsibility to comply with the seismic or any other requirements of the North Carolina State Building Code.

## 1.24 GUARANTEE

- A. The Contractor shall guarantee the materials and workmanship covered by these drawings and specifications for a period of one year from the date of acceptance by the Owner. The Contractor shall repair and/or replace any parts of any system that may prove to be defective at

no additional cost to the Owner within the guarantee period. All equipment warranties shall be as specified and included in the Contract Documents.

1.25 PHASING OF THE WORK

- A. The Electrical Contractor shall schedule his work as described in the relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.

1.26 ALTERNATE BIDS

- A. Alternate bid items are described in relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.

PART 2 - PRODUCTS                      Not Used

PART 3 - EXECUTION                      Not Used

END OF SECTION 260500

## SECTION 260519 - BUILDING WIRE AND CABLE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Building wire and cable.
- B. Wiring connectors and connections.

#### 1.2 RELATED SECTIONS

- A. Section 260533 - Conduit.
- B. Section 260534 - Boxes.
- C. Section 260553 - Identification.

#### 1.3 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.
- B. NECA Standard of Installation (National Electrical Contractors Association).

#### 1.4 SUBMITTALS

- A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, ratings, colors, and configurations.
- C. Test Reports: Indicate procedures and values obtained.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

#### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

#### 1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

#### 1.7 PROJECT CONDITIONS

- A. All wire and cable shall be installed in conduit. This includes all power wiring; fire alarm, sound and communications wire and cable (unless noted otherwise); HVAC control cable; etc.
- B. Verify that field measurements are as shown on Drawings.
- C. Conductor sizes are based on 75° C. copper.
- D. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.
- E. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

#### 1.8 COORDINATION

- A. Coordinate Work under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

## PART 2 - PRODUCTS

### 2.1 BUILDING WIRE AND CABLE

- A. Description: Single conductor insulated building wire.
- B. Conductor: Copper. Solid and stranded as specified below. Minimum #12 AWG, maximum 500 KCMil.
- C. Insulation/Voltage Rating: 600 volts.
- D. Insulation: Dual-rated THHN/THWN or XHHW.
- E. Color Coding: 120/240 volts and 208/120 volts
  - Phase A - Black
  - Phase B - Red
  - Phase C - Blue
  - Neutral - White
  - Ground - Green

### 2.2 WIRING CONNECTORS AND CONNECTIONS

- A. Conductors shall be installed continuous from outlet to outlet with no splicing except within outlet or junction boxes, troughs and gutters. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- B. Use mechanical connectors for copper conductor splices and taps, 8 AWG and larger, except main grounding conductors, which shall be terminated with compression lugs. Tape un-insulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor or use UL-approved insulating covers.
- C. Use insulated spring wire connectors with plastic caps for copper conductors, 10 AWG and smaller, splices and taps in junction boxes, outlet boxes and lighting fixtures, Ideal "wirednuts" or 3M Company "Scotchlock". "Push wire" type connectors are not acceptable.
- D. "Sta-Kon" or other permanent type crimp connectors shall not be used for branch circuit connections.
- E. Joints in stranded conductors shall be spliced by approved mechanical connectors and gum rubber tape or friction tape. Solderless mechanical connectors for splices and taps, provided with U.L approved insulating covers, may be used instead of mechanical connectors plus tape.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire has been completed.
- C. Verify that raceway installation is complete and supported.

### 3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

### 3.3 WIRING METHODS

- A. Concealed Dry Interior Locations: Use only building wire in raceway.
- B. Exposed Dry Interior Locations: Use only building wire in raceway.
- C. Above Accessible Ceilings: Use only building wire in raceway.
- D. Wet or Damp Interior Locations: Use only building wire in raceway.
- E. Exterior Locations: Use only building wire in raceway.
- F. Underground Installations: Use only building wire in raceway.



### 3.4 INSTALLATION

- A. Install products in accordance with manufacturers instructions.
- B. Route wire and cable as required to meet Project Conditions.
- C. Install cable in accordance with the NECA "Standard of Installation".
- D. Use solid conductor for feeders and branch circuits 10 AWG and smaller, and Class B stranded for larger conductors.
- E. Use conductor not smaller than 12 AWG for power and lighting circuits.
- F. Use conductor not smaller than 14 AWG for fire alarm and control circuits.
- G. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet (23 m) or branch circuit homeruns longer than 50 feet.
- H. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet or branch circuit homeruns longer than 125 feet.
- I. Pull all conductors into raceway at same time.
- J. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- K. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- L. Clean conductor surfaces before installing lugs and connectors.
- M. Identify wire and cable under provisions of Section 260553.
- N. Identify each conductor with its circuit number or other designation indicated on Drawings.
- O. Common neutral multiwire receptacle branch circuits are not permitted. Provide separate, individual neutral conductors for receptacle circuits.

### 3.5 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Inspect wire for physical damage and proper connection.
- C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- D. Verify continuity of each branch circuit conductor.
- E. Prior to energizing, feeders, sub-feeders and service conductor cables shall be tested for electrical continuity and short circuits. A copy of these tests shall be sent to the North Carolina State Construction Office through the Architect.

END OF SECTION 260519



## SECTION 260526 - GROUNDING AND BONDING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Grounding electrodes and conductors.
- B. Equipment grounding conductors.

#### 1.2 REFERENCES

- A. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
- B. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).
- C. NFPA 70 - National Electrical Code.

#### 1.3 GROUNDING SYSTEM DESCRIPTION

- A. The earth electrode shall be:
  - 1. Ground Rods: Size as specified below as required on plans. The jumper shall be sized in accordance with the NEC and the connection at the rod shall be brazed or exothermically welded. The points of connection to the earth electrode system shall be visible and accessible upon completion of construction.

#### 1.4 PERFORMANCE REQUIREMENTS

The ground resistance of the earth electrode shall not exceed 25 ohms. The Electrical Contractor shall test the earth electrode using a standard three point ground resistance tester and shall advise the Architect/Engineer of the results of such tests in writing. Where tests show the resistance to ground exceeds 25 ohms, appropriate action shall be taken to reduce the resistance to 25 ohms, or less, by driving additional ground rods or other approved methods. Compliance shall be demonstrated by retesting.

#### 1.5 SUBMITTALS FOR REVIEW

- A. Submittals: Procedures for submittals. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide for grounding electrodes and connections.

#### 1.6 SUBMITTALS FOR INFORMATION

- A. Submittals: Submittals for information. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Test Reports: Indicates overall resistance to ground and resistance of each electrode.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

#### 1.7 SUBMITTALS FOR CLOSEOUT

- A. Contract Closeout: Procedures for submittals as required under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Project Record Documents: Record actual locations of components and grounding electrodes.
- C. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

## 1.8 QUALIFICATIONS

Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.

## 1.9 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

## PART 2 - PRODUCTS

### 2.1 ROD ELECTRODES

- A. Material: Copper-clad steel.
- B. Diameter: 3/4 inch (19mm)
- C. Length: 10 feet (3000 mm).

### 2.2 MECHANICAL CONNECTORS

Material: Cast bronze, brass, or plain malleable iron. Ground clamps shall not be fabricated from aluminum or any aluminum alloy.

### 2.3 WIRE

Material: Stranded copper sized per NEC requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Coordination and Meetings: Verify existing conditions prior to beginning work as required under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

### 3.2 INSTALLATION

- A. Quality Control: Manufacturer's instructions shall be followed as required under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Provide bonding to meet Regulatory Requirements.
- C. Provide separate, insulated conductor within each feeder and branch circuit raceway.
- D. Equipment Grounding Conductor: The raceway system shall not be relied on for ground continuity. A green grounding conductor, properly sized per the NEC (Table 250-122) shall be run in all raceways. Terminate each end on suitable lug, bus, or bushing. Exceptions are as follows:
  - 1. Raceways for telecommunications.
  - 2. Raceways for data.
- E. Equipment grounding continuity shall be maintained through flexible conduit as required in previous sections.
- F. Grounding conductors shall be installed as to permit the shortest and most direct path from equipment to ground. All connections to ground conductors shall be accessible for

inspection and made with approved solderless connectors, brazed or bolted to the equipment or structure to be grounded. All contact surfaces shall be thoroughly cleaned before connections are made to insure good metal to metal contact.

- G. All equipment housings and/or enclosures, and all non-current carrying metallic parts of electrical equipment, raceway systems, etc., shall be effectively and adequately bonded to ground.
- H. Boxes with concentric, eccentric or over-sized knockouts shall be provided with bonding bushings and jumpers. The jumper shall be sized per the NEC and lugged to the box.
- I. An equipment ground bus shall be installed in each panelboard for terminating equipment grounding conductors.
- J. All wiring devices equipped with grounding connections shall be permanently and securely connected to the enclosure in which they are mounted with a copper grounding jumper.
- K. The frame of all lighting fixtures shall be securely grounded to the equipment ground system with grounding conductors.
- L. Install rod electrodes at locations indicated.

### 3.3 FIELD QUALITY CONTROL

- A. Quality Assurance: Field inspection, testing and adjusting as required under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Inspect and test in accordance with NETA ATS, except Section 4, or provide for qualified technicians to perform testing according to the manufacturer's recommendations.

END OF SECTION 260526



## SECTION 260529 - SUPPORTING DEVICES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Conduit and equipment supports.
- B. Anchors and fasteners.

#### 1.2 REFERENCES

- A. NECA - National Electrical Contractors Association.
- B. ANSI/NFPA 70 - National Electrical Code.

#### 1.3 SUBMITTALS

- A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide manufacturer's catalog data for fastening systems.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

#### 1.4 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

### PART 2 - PRODUCTS

#### 2.1 PRODUCT REQUIREMENTS

- A. Materials and Finishes: Provide adequate corrosion resistance. See Specifications Section 260500, Para. 1.14 for additional hardware corrosion resistance requirements.
- B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
- C. Anchors and Fasteners:
  - 1. Concrete Structural Elements: Use expansion anchors.
  - 2. Steel Structural Elements: Use beam clamps.
  - 3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
  - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts.
  - 5. Solid Masonry Walls: Use expansion anchors.
  - 6. Sheet Metal: Use sheet metal screws or bolts
  - 7. Wood Elements: Use wood screws.

### PART 3 - EXECUTION

#### 2.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
- C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- D. Do not use powder-actuated anchors.
- E. Obtain permission from Architect/Engineer before drilling or cutting structural members.

- F. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- G. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- H. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch (25 mm) off wall.
- I. Conduits installed on the interior of exterior building walls shall be spaced away from the wall surface a minimum of 1/4 inch (65mm) using “clamp-backs” or struts.
- J. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION 260529



## SECTION 260533 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Metal conduit.
- B. Flexible metal conduit.
- C. Liquidtight flexible metal conduit.
- D. Electrical metallic tubing.
- E. Nonmetallic conduit.

#### 1.2 RELATED SECTIONS

- A. Section 260534 - Boxes.
- B. Section 260526 - Grounding and Bonding.
- C. Section 260529 - Supporting Devices.
- D. Section 260553 - Electrical Identification.

#### 1.3 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- D. ANSI/NFPA 70 - National Electrical Code.
- E. NECA "Standard of Installation".
- F. NEMA TC2 - Schedule 40 PVC
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

#### 1.4 DESIGN REQUIREMENTS

Conduit Size: ANSI/NFPA 70.

#### 1.5 SUBMITTALS

- A. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide for metallic conduit, flexible metal conduit, liquidtight flexible metal conduit, metallic tubing, nonmetallic conduit, fittings and conduit bodies.

#### 1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Accurately record actual routing of conduits larger than 2 inches (51 mm).

#### 1.7 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle Products to site under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

- B. Accept conduit on site. Inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- D. Protect PVC conduit from sunlight.

#### 1.9 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

### PART 2 - PRODUCTS

#### 2.1 CONDUIT REQUIREMENTS

- A. Size: Conduit shall be sized in accordance with the latest edition of the NEC unless shown otherwise, with minimum conduit size being 3/4 inch, except homeruns minimum size shall be 3/4". Flexible metal and watertight ("sealtite") conduit in size 1/2 inch and larger are acceptable for motor, appliance and fixture connections provided green ground wire is installed (see Section 260526) and NEC is followed.
- B. All conduit will be provided with insulated throat.
- C. Underground Installations:
  - 1. More than Five Feet from Foundation Wall: Use rigid steel conduit, intermediate metal conduit, plastic coated conduit, thickwall nonmetallic conduit and thinwall nonmetallic conduit.
  - 2. Within Five Feet from Foundation Wall: Use rigid steel conduit.
  - 3. In or Under Slab on Grade: Use rigid steel conduit, intermediate metal conduit, plastic coated conduit, thickwall nonmetallic conduit and thinwall nonmetallic conduit.
  - 4. Minimum Size: 1 inch (25 mm).
- D. Outdoor Locations, Above Grade: Use rigid steel conduit.
- E. Wet and Damp Locations: Use rigid steel conduit.
- F. Dry Locations:
  - 1. Concealed: Use rigid steel conduit, intermediate metal conduit or electrical metallic tubing. EMT may be utilized as permitted by the NEC, with the following restrictions. EMT shall not be installed:
    - a. where tubing, couplings, elbows and fittings would be in direct contact with the earth.
    - b. underground (in/below slab-on-grade or in earth).
    - c. any location outdoors where the tubing, etc., would be subjected to the elements.
    - d. where subject to severe corrosive influence.
    - e. where subject to severe physical damage.
  - 2. Exposed: Use rigid steel conduit or intermediate metal conduit.

#### 2.2 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Plastic-Coated Rigid Steel Conduit: ANSI C80.1, 40 mil PVC coating.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit with all steel fittings.

- 2.3 FLEXIBLE METAL CONDUIT
  - A. Description: Interlocked steel construction.
  - B. Fittings: ANSI/NEMA FB 1, steel.
- 2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT
  - A. Description: Interlocked steel construction with PVC jacket.
  - B. Fittings: ANSI/NEMA FB 1, steel or nonmetallic type.
- 2.5 ELECTRICAL METALLIC TUBING (EMT)
  - A. Description: ANSI C80.3; galvanized tubing.
  - B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression type, insulated throat.
- 2.6 NONMETALLIC CONDUIT
  - A. Description: NEMA TC 2; Schedule 40 PVC.
  - B. Fittings and Conduit Bodies: NEMA TC 3.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Circuiting is shown schematically. Exact routing of branch circuits may be varied to suit building construction; however, the combination of circuits within raceways and panelboard connections shall not be changed from those shown on the drawings.
- B. Raceways shall be installed concealed in finished areas. Where construction does not permit concealed raceways and where indicated on the drawings, raceways shall be run exposed. Exposed raceways shall be run parallel to, or at a right angle with the building walls. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- C. Where any run of rigid conduit may change to a run of EMT or vice-versa, each change shall be made in a junction or outlet box with each conduit terminated separately therein. Rigid conduit to EMT (or vice-versa) adapters shall not be permitted.
- D. Install conduit in accordance with NECA "Standard of Installation".
- E. Arrange conduit to maintain headroom and present neat appearance.
- F. Maintain adequate clearance between conduit and piping.
- G. Maintain 12 inch (300 mm) clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).
- H. Cut conduit square using saw or pipecutter and de-burr cut ends.
- I. Bring conduit to shoulder of fittings; fasten securely.
- J. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

- K. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows, or hydraulic one-shot bender, to fabricate bends in metal conduit larger than 2 inch size.
- L. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- M. Provide suitable fittings to accommodate expansion and deflection where conduit crosses, control and expansion joints.
- N. Provide suitable pull string in each empty conduit except sleeves and nipples.
- O. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
- P. The raceway system shall not be relied on for grounding continuity. Ground and bond conduit under provisions of Section 260526.
- Q. Identify conduit under provisions of Section 260553.
- R. The use of “LB’s” shall be limited where possible. Where necessary to use “LB’s” sized above 2 inch, mogul units shall be installed.
- S. Where concentric, eccentric or over-sized knockouts are encountered, a grounding type insulated bushing shall be provided.
- T. Fasten conduit supports to building structure and surfaces under provisions of Section 260529.
- U. Arrange supports to prevent misalignment during wiring installation.
- V. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- W. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
- X. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
- Y. Do not attach conduit to ceiling support wires.
- Z. All metallic raceways entering or leaving panelboards (branch circuits less than 30 amperes in lighting and appliance branch circuit panelboards excepted), switchboards, transfer switches, enclosed circuit breakers, safety switches, transformers, etc. shall be provided with insulated grounding and bonding bushings and each separate piece of raceway shall be individually bonded to the equipment ground bus or metallic enclosure, as applicable, by means of copper conductor sized in accordance with the National Electrical Code.
- AA. The term “fittings” includes couplings, connectors, offsets, LBs, etc.
- BB. No pressure cast (pot metal) fittings or conduit bodies shall be allowed.

- CC. Outlets, junction, taps, etc., on exposed rigid metal conduit shall be cast metal conduit fittings or cast metal boxes of the type and size appropriate for the location. Sheet steel outlet boxes shall not be permitted on exposed raceway runs except at or near a ceiling for interior construction.
- DD. EMT couplings and terminations shall be made utilizing steel-plated hexagonal compression connectors. No set screw or indented type fittings shall be utilized.
- EE. EMT couplings and terminations shall be “concrete tight” where buried in masonry or concrete. EMT fittings, where installed in damp locations, shall be of the “raintight” type.
- FF. Install nonmetallic conduit in accordance with manufacturer’s instructions.
- GG. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- HH. PVC schedule 40 shall not be used exposed or concealed in gypsum walls, but may be used in CMU walls.
- II. IMC and GRC shall terminate with either a double locknut / bushing set, or in a threaded hub.
- JJ. Conduit couplings for IMC, GRC and PVC shall be in accordance with the NEC.
- KK. The placement of conduit in floor slabs shall be thoroughly coordinated with the General Contractor to avoid conflicts with steel reinforcing bars, reductions in net concrete sections and floor penetrations.
- LL. Route conduit under slab from point-to-point.
- MM. Where underground or underslab raceways are required to turn up into cabinets, equipment, etc., and on to poles, the elbow required and the stub-up out of the slab or earth shall be of plastic -coated rigid steel.
- NN. Raceways run external to building foundation walls, with the exception of branch circuit raceways, shall be encased with a minimum of three (3) inches of concrete on all sides.
- OO. Branch circuit raceways run underground external to building foundation walls shall be run in raceways installed in accordance with the NEC, and shall be of a type approved by the NEC as “suitable for direct burial.” Minimum raceway size shall be 1 inch.
- PP. Raceways run underground, internal to building foundation walls shall be of a type, and installed by a method approved by the NEC.
- QQ. Raceways that penetrate outside walls, ceilings from conditioned space or other similar condition shall be effectively sealed to prevent condensation from infiltrating humid air.

- RR. Where raceways pass through a below grade wall, from a conditioned interior building space, the raceway shall be sealed utilizing fittings similar and equal to OZ/GEDNEY type “FSK” thru-wall fitting with “FSKA” membrane clamp adapter if required.
- SS. All underground raceways shall be identified by underground line marking tape within the provisions of Section 260553. The tape to be located directly above the raceway and 6 to 8 inches below finished grade.
- TT. EMT conduit provided below roof deck shall be installed 1 1/2 inches away from the deck to allow for screws not to penetrate the EMT conduit during reroofing.
- UU. Conduits, JB's, Troughs, any enclosure when mounted outside on the walls, shall be off the walls by one inch.

### 3.2 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods under the provisions of Division 7.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified under Division 7.

END OF SECTION 260533

## SECTION 260534 - BOXES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Wall outlet boxes.
- B. Pull and junction boxes.

#### 1.2 RELATED SECTIONS

- A. Section 262726 - Wiring Devices: Wall plates in finished areas.
- B. Section 260529 – Supporting Devices.

#### 1.3 REFERENCES

- A. NECA - Standard of Installation.
- B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- E. NFPA 70 - National Electrical Code.

#### 1.4 SUBMITTALS FOR REVIEW

- A. Submittals: Procedures for submittals. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide manufacturer's catalog information showing dimensions and configurations.

#### 1.5 SUBMITTALS FOR CLOSEOUT

- A. Contract Closeout: Submittals for Project closeout. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

#### 1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Provide Products listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

## PART 2 - PRODUCTS

### 2.1 OUTLET BOXES

- A. Sheet Metal Outlet Boxes (for interior conditioned spaces only): NEMA OS 1, galvanized steel.
  - 1. Junction, switch, receptacle and outlet boxes for interior use in dry locations shall be zinc coated or cadmium plated sheet steel, 4" square and 2-1/8" deep, unless otherwise indicated on the contract drawings. Smaller and shallower outlet boxes will be permitted only by special permission of the Architect/Engineer where such boxes are necessary due to structural conditions encountered. Where larger junction boxes are required, they shall be fabricated from No. 10, 12, 14 or 16 gauge sheet steel as required by the Underwriters Laboratories, Inc., and galvanized after fabrication. All junction boxes shall have screw fastened covers. Outlet boxes shall be provided with extension plaster rings where required by structural and finish conditions. Sheet steel boxes shall be as manufactured by Appleton, Raco, Steel City or Spring City.
  - 2. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 2 inch (13 mm) male fixture studs where required.
- B. Cast Boxes (for all exterior and exposed unconditioned spaces): NEMA FB 1, Type FD, cast fer alloy. Provide gasketed cover by box manufacturer. Provide threaded hubs. Cast boxes shall be by Crouse-Hinds, Appleton, O. Z. Gedney or Killark.

### 2.2 PULL AND JUNCTION BOXES

Sheet Metal Boxes: NEMA OS 1, galvanized steel.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Verify locations of outlets prior to rough-in.

### 3.2 INSTALLATION

- A. Install boxes in accordance with NECA "Standard of Installation".
- B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- C. Set wall mounted boxes at elevations to accommodate mounting heights indicated and specified in section for outlet device. Boxes are shown on Drawings in approximate locations unless dimensioned. Adjust box location up to 10 feet (3 m) if required to accommodate intended purpose. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Install boxes to preserve fire resistance rating of partitions and other elements, using approved materials and methods. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes. Use flush mounting outlet box in finished areas. Use stamped steel bridges to fasten flush mounting outlet box between studs.



### 3.3 ADJUSTING

- A. Contract Closeout: Adjust installed work under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closures in unused box openings.

### 3.4 CLEANING

- A. Contract Closeout: Clean installed work under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces and restore finish.

END OF SECTION 260534



## SECTION 260553 - ELECTRICAL IDENTIFICATION

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Nameplates and labels.
- B. Wire and cable markers.
- C. Conduit markers.
- D. Wiring device plates marking.
- E. Underground warning tape.

#### 1.2 RELATED SECTIONS

Division 9: Painting.

#### 1.3 REFERENCES

ANSI/NFPA 70 - National Electrical Code.

#### 1.4 SUBMITTALS

- A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide catalog data for nameplates, labels, and markers.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

#### 1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

### PART 2 - PRODUCTS

#### 2.1 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic as follows:

Furnish and install engraved laminated phenolic nameplates for all electrical equipment supplied under this contract for identification of system, equipment controlled or served, phase, voltage, ampacity, etc. Nameplates shall be securely attached to equipment with

stainless steel screws, and shall identify by name the equipment controlled, attached, etc. Embossed, self adhesive plastic tape is not acceptable for marking equipment. Nameplate material colors shall be:

1. Blue surface with white core for all 120/208 volt equipment.
2. Black surface with white core for 277/480 volt equipment.
3. Bright red surface with white core for all equipment related to fire alarm system.
4. Dark red (burgundy) surface with white core for all equipment related to Security.
5. Green surface with white core for all equipment related to “emergency” systems.
6. Orange surface with white core for all equipment related to telephone systems.
7. Brown surface with white core for all equipment related to data systems.
8. White surface with black core for all equipment related to paging systems.
9. Purple surface with white core for all equipment related to TV systems.

B. Locations:

1. Each electrical distribution and control equipment enclosure (safety switches, panelboards, transformers, etc.)
2. Communication cabinets.
3. Pull and splice boxes.

C. Letter Size: Letters shall be a minimum of 1/2 inch (13 mm) high.

## 2.2 WIRE MARKERS

A. Description: Split sleeve type wire markers or approved equivalent.

B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.

C. Legend:

1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on drawings.
2. Control Circuits: Control wire number as indicated on schematic and interconnection diagrams on drawings.

## 2.3 CONDUIT, RACEWAY AND BOX MARKING

Paint visible surfaces of exposed junction and outlet boxes and covers of raceway systems above

lay-in and other accessible ceilings. Paint all boxes and covers before installation. Paint exposed conduit and raceways at ten foot minimum intervals with a 6 inch wide band in accordance with the color scheme outlined above. Mark conduits at junction boxes above accessible ceilings with the panelboard and circuit numbers of the circuits contained in the raceway using a permanent black marking pen.

## 2.4 WIRING DEVICE PLATES MARKING

### A. Description:

1. Adhesive backed, laminated plastic receptacle device plate labels identifying the circuit feeding the device. Labels shall be label machine printed, black lettering on a clear background, to indicate panel and circuit number and shall be Casio, Brother, T&B or approved equal.
2. Print circuit number on flag type plastic cable tie with a permanent marker (Sharpie, etc.) and attach to conductors in outlet box. Flag shall be readily visible upon removal of device plate.

B. Locations: Each receptacle device plate. Apply centered on the lower portion below the receptacle, parallel to the lower surface.

C. Legend: Typed labels to indicate panel and circuit number feeding the device (i.e., RPA-24).

## 2.5 UNDERGROUND WARNING TAPE

6 inch (150 mm) wide, 4 mils thick, minimum, permanent plastic tape compounded for direct burial, detectable type, colored bright yellow with suitable continuous warning legend describing buried electrical lines.

## PART 3 - EXECUTION

### 3.1 PREPARATION

Degrease and clean surfaces to receive nameplates and labels.

### 3.2 APPLICATION

- A. Install nameplate parallel to equipment lines.
- B. Secure nameplate to equipment front using self tapping stainless steel screws, lockwashers and acorn nuts as shown on the Drawings.
- C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.
- D. Install receptacle identification labels at top of each device plate, parallel to upper surface.
- E. Identify conduit using field painting under provisions of Division 9.
- F. All empty conduit runs and conduit with conductors for future use shall be identified for use and shall indicate where they terminate. Identification shall be by tags with string or wire

attached to conduit or outlet.

- G. Update all existing panelboard directories where changes are made. Provide new panel schedule cards as required to maintain legibility.
- H. Identify underground conduits using one underground warning tape per trench at 6 - 8 inches below finished grade.
- I. Install adhesive backed labels and nameplates only when ambient temperature and humidity conditions for adhesive use are within range recommended by manufacturer.

END OF SECTION 260553

## SECTION 260580 - EQUIPMENT WIRING SYSTEMS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

Electrical supply for, and connections to, equipment specified under other Divisions.

#### 1.2 RELATED DIVISIONS AND SECTIONS

- A. Division 1: Owner-furnished equipment.
- B. Specification 260533 – Conduit.
- C. Specification 260519 - Building Wire and Cable.
- D. Specification 260534 – Boxes.
- E. Specification 260526 - Grounding and Bonding.

#### 1.3 REFERENCES

- A. NEMA WD 1 - General Purpose Wiring Devices.
- B. NEMA WD 6 - Wiring Device Configurations.
- C. ANSI/NFPA 70 - National Electrical Code.

#### 1.4 SUBMITTALS

- A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

#### 1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.
- C. Where electrical wiring is required by trades other than covered by Division 26, specifications for that section shall refer to same wiring materials and methods as specified under Division 26.

## 1.6 COORDINATION

- A. Coordinate work under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment furnished under other sections.
- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation schedule for equipment.
- E. Sequence electrical connections to coordinate with start-up schedule for equipment.

## PART 2 - PRODUCTS

### 2.1 CORDS AND CAPS

- A. Attachment Plug Construction: Conform to NEMA WD 1.
- B. Configuration: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
- C. Cord Construction: ANSI/NFPA 70, Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
- D. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify conditions under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Verify that equipment is ready for electrical connection, wiring, and energization.

### 3.2 ELECTRICAL WORK IN CONNECTION WITH OTHER CONTRACTS

- A. The Electrical Contractor shall provide a source of power for General Contractor-furnished and Owner-furnished equipment shown on the Drawings. Provide pigtails, flexible connections, conductors, raceways, circuit breakers, safety switches, receptacles, junction boxes, panelboards and/or wiring troughs as detailed in this section and/or as shown on the Drawings.
- B. Safety switches, fuses, variable speed drives, magnetic motor starters, magnetic motor starter overload elements, control devices and sensors and control wiring and control raceways for such equipment will be provided and installed by the contractor providing the equipment.



The locations of local disconnecting means furnished by other divisions are shown on the respective division's Drawings. Coordinate exact locations with the contractor providing the equipment. Coordinate and verify all electrical requirements, connections, phasing and rotation, overcurrent and overload protective device sizes with the Contractor providing the equipment or the Owner in the case of Owner-furnished equipment. See other specifications divisions for further explanation of contractor responsibility. Do not apply power to equipment without the permission of the contractor providing the equipment.

- C. General Contractor Provided Equipment: The Electrical Contractor shall provide a power source adjacent to equipment provided by the General Contractor. Final connections to this equipment shall be provided by the Electrical Contractor. Coordinate exact locations and requirements with the General Contractor.
- D. Owner Provided Equipment: The Electrical Contractor shall provide a power source adjacent to equipment provided by the Owner. Coordinate exact locations and requirements with the General Contractor. Final connection to the equipment will be provided by the Electrical Contractor. Provide receptacle configurations and/or provide direct connection as required by equipment and coordinate exact locations and configurations with the Owner. Do not apply power to equipment without the permission of the Owner.

### 3.3 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Make wiring connections using wire and cable with insulation suitable for temperatures encountered in heat producing equipment.
- D. Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field-supplied attachment plug is indicated.
- E. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- F. Install disconnect switches, controllers, control stations, and control devices as indicated.
- G. Modify equipment control wiring with terminal block jumpers as indicated.
- H. Provide interconnecting conduit and wiring between devices and equipment where indicated.

END OF SECTION 260580



## SECTION 262726 - WIRING DEVICES

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Receptacles.
- B. Wall plates.

#### 1.2 DESCRIPTION

Provide wiring devices in types, characteristics, grades, colors and electrical ratings for applications indicated which are UL listed and which comply with NEMA WD 1 and other applicable UL, NEMA and DSCC (Fed Spec) standards.

#### 1.3 RELATED SECTIONS

Section 260534 - Boxes.

#### 1.4 REFERENCES

- A. NECA - Standard of Installation.
- B. NEMA WD 1 - General Requirements for Wiring Devices.
- C. NEMA WD 6 - Wiring Device - Dimensional Requirements.
- D. NFPA 70 - National Electrical Code.
- E. Underwriters Laboratories (UL 20, 244A, 498, 514C, 1472).
- F. DSCC (Fed Spec) W-C-596G

#### 1.5 SUBMITTALS FOR REVIEW

- A. Submittals: Procedures for submittals. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

#### 1.6 SUBMITTALS FOR INFORMATION

- A. Submittals: Submittals for information. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Submit manufacturer's wiring and installation instructions.
- C. Product Data: Catalog cut sheets with performance specifications demonstrating compliance with specified requirements.

#### 1.7 QUALIFICATIONS

Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 10 years documented experience.

1.8 WARRANTY

Provide manufacturer's full 1 year warranty minimum, unless specified otherwise.

1.9 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 GROUND FAULT CIRCUIT INTERRUPTERS (GFI)

A. Manufacturers:

1. Hubbell Model GFR8300.

2. Leviton.

3. Pass and Seymour.

4. Substitutions: Refer to provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

B. Description: NEMA WD 1, UL, DSCC, heavy-duty, 20 ampere, 120 volt, general use, duplex, straight blade, grounding type receptacle arranged for back and side wiring, with separate single or double grounding terminals. Receptacles shall have a full wrap around brass bridge with integral ground and standup double wipe contacts. The electronic component's circuit board shall be all glass with a conformal coating. Self grounding or automatic type grounding receptacles are not acceptable in lieu of receptacles with separate grounding screw lugs and a direct, green insulated conductor connection to the equipment grounding system.

C. Device Face and Body: Gray nylon or reinforced thermoplastic.

D. Configuration: NEMA WD 6, type as specified and indicated.

E. Convenience Receptacle: Type 5-20R.

2.2 WALL PLATES

A. Manufacturers:

1. Hubbell.

2. Leviton.

3. Pass and Seymour.

4. Substitutions: Refer to provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Weatherproof Cover Plate: Exterior mounted receptacles, and those noted to be weatherproof, shall be provided with weatherproof PVC transparent cover plates, standard size, and shall be single or ganged as indicated on the contract drawings. Weatherproof plates shall be “approved” third party listed as “raintight while in use”.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Ensure that outlet boxes are installed at proper height.
- B. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

### 3.2 PREPARATION

- A. Clean debris from outlet boxes.

### 3.3 INSTALLATION

- A. Install in accordance with NECA “Standard of Installation”.
- B. Install devices vertically, plumb and level.
- C. Install receptacles with grounding pole on top. Install horizontally oriented receptacles with the grounding pole on the left.
- D. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- E. Connect receptacles by utilizing back wiring provisions only. Do not use side wire terminals.
- F. Provide adhesive backed, laminated plastic receptacle device plate labels identifying the circuit feeding the device. Labels shall be label machine printed to indicate panel and circuit number and shall be Casio, Brother, T&B or approved equal. See Section 260553 for additional requirements

### 3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 260534 to obtain mounting heights specified and indicated on drawings.

### 3.5 FIELD QUALITY CONTROL

- A. Quality Control. As required under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Inspect each wiring device for defects.

- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for correct polarity and for ground continuity.
- E. Test each GFCI receptacle device for correct operation.

### 3.6 ADJUSTING

- A. Contract Closeout: Adjust installed work under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Adjust devices and wall plates to be flush and level.

### 3.7 CLEANING

- A. Contract Closeout: Clean installed work under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION 262726

## SECTION 265619 - LED EXTERIOR LIGHTING

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
2. Luminaire supports.
3. Luminaire-mounted photoelectric relays.

#### 1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color rendering index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating
- E. Lumen: Measured output of lamp and luminaire, or both.
- F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of luminaire.
  1. Include plans, elevations, sections, and mounting and attachment details.
  2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  3. Include diagrams for power, signal, and control wiring.
- B. Shop Drawings: For nonstandard or custom luminaires.
  1. Include design calculations for luminaire supports and seismic restraints.
- C. Delegated-Design Submittal: For luminaire supports.
  1. Include design calculations for luminaire supports and seismic restraints.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans, drawn to scale and coordinated.
- B. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.

C. Product Certificates: For each type of the following:

1. Luminaire.
2. Photoelectric relay.

D. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.6 FIELD CONDITIONS

A. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.7 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 5 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.

1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified.

2.2 LUMINAIRE 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.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.



- E. Lamp base complying with ANSI C81.61.
- F. CRI of 80. CCT of 5000K.
- G. L70 lamp life of 50,000 hours.
- H. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- I. Nominal Operating Voltage: 120 V ac.
- J. In-line Fusing: Separate in-line fuse for each luminaire.
- K. Lamp Rating: Lamp marked for outdoor use.
- L. Source Limitations: Obtain luminaires from single source from a single manufacturer.
- M. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

## 2.3 LUMINAIRE TYPES

- A. Area and Site:
  - 1. See fixture schedule for information.

## PART 3 - EXECUTION

### 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with NECA 1.
- B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Install lamps in each luminaire.
- D. Fasten luminaire to structural support.
- E. Supports:
  - 1. Sized and rated for luminaire weight.
  - 2. Able to maintain luminaire position after cleaning and relamping.
  - 3. Support luminaires without causing deflection of finished surface.
  - 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- F. Wiring Method: Install cables in raceways. Conceal raceways and cables.
- G. Install luminaires at height as indicated on Drawings.

H. Coordinate layout and installation of luminaires with other construction.

### 3.2 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with ~~0.010-inch-~~ (0.254-mm-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

### 3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

### 3.4 FIELD QUALITY CONTROL

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
  - B. Perform the following tests and inspections:
    - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
    - 2. Verify operation of photoelectric controls.
  - C. Illumination Tests:
    - 1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):
      - a. IES LM-5.
      - b. IES LM-50.
      - c. IES LM-52.
      - d. IES LM-64.
      - e. IES LM-72.
    - 2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
  - D. Luminaire will be considered defective if it does not pass tests and inspections.
  - E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.
- ### 3.5 DEMONSTRATION
- A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

END OF SECTION 265619

## SECTION 270510 - TELECOMMUNICATIONS PATHWAYS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Equipment and terminal backboards.
- B. Premises wiring raceways and outlets.

#### 1.2 REFERENCES

The State of North Carolina expects and enforces strict adherence to the latest published versions of the following codes and standards:

1. Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Final Guidelines (July 1991) – 36 CFR Part 1191
2. Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant – TIA / EIA-526 -7 (OFSTP-7)
3. Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant – TIA / EIA-526 - 14 (OFSTP-14A)
4. Commercial Building Telecommunications Wiring Standard – TIA / EIA-568 - B.1
5. Commercial Building Telecommunications Wiring Standard – TIA / EIA-568 - B.2
6. Commercial Building Telecommunications Wiring Standard – TIA / EIA-568 - B.3
7. Telecommunications Pathways and Spaces – TIA / EIA - 569
8. Residential Telecommunications Cabling Standard – TIA / EIA - 570
9. Optical Fiber Cable Color Coding – TIA / EIA - 598
10. Administration Standard for the Telecommunications Infrastructure of Commercial Buildings – ANSI / TIA / EIA-606
11. Commercial Building Grounding and Bonding Requirements for Telecommunications – TIA / EIA - 607
12. Customer-Owned Outside Plant Telecommunications Standard – TIA / EIA - 758
13. Detail Specification for 62.5- $\mu$ m Core Diameter / 125- $\mu$ m Class 1a Multimode Graded Index Optical Waveguide Fibers – TIA / EIA - 492AAAA
14. Generic Requirements for Optical Fiber and Optical Fiber Cable – Bellcore TR-TSY-000020
15. National Electrical Code (NEC) Articles 600, 700 & 800
16. National Fire Protection Association (NFPA) NFPA - 71, - 72, - 75, - 780.
17. BICSI - Telecommunications Distribution Methods Manual (Newest Edition) Building Industry Consulting Service International
18. BICSI - Customer-Owned Outside Plant Design Manual (Newest Edition) Building Industry Consulting Service International
19. Customer –Owned Outside Plant Telecommunications Cabling Standard TIA / EIA –758 – 1

#### 1.3 SYSTEM DESCRIPTION

Individual and combination telecommunications/data outlets shall be installed where shown on the contract drawings. Raceways shall be installed as straight as possible and shall contain not more than the equivalent of three quarter bends.

#### 1.4 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

- B. Record actual locations and sizes of pathways and outlets.

#### 1.5 QUALITY ASSURANCE

- A. Telephone Utility: Field verify.
- B. Perform Work in accordance with telephone utility's rules and regulations.

#### 1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Furnish Products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.
- C. Shall conform to Coastal Carolina Community College Telecommunications Department Guidelines.
- D. Shall conform to North Carolina STS-1000 Telecommunications Guidelines, which can be downloaded from the web site [https://files.nc.gov/ncdoa/documents/files/STS1000\\_ITS.pdf](https://files.nc.gov/ncdoa/documents/files/STS1000_ITS.pdf) /

### PART 2 - PRODUCTS

#### 2.1 TELECOMMUNICATIONS OUTLETS

Outlets shall consist of standard, square cornered boxes 4-11/16" wide by 4-11/16" high by 2-1/8" deep, minimum, flush mounted at the height indicated on the contract drawings. Provide a single gang plaster ring for the square cornered boxes 4-11/16" wide by 4-11/16" high by 2-1/8" deep.

#### 2.2 TELECOM WIRE AND CABLE

All telephone, data and fiber cable shall be furnished and installed by the contractor.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Finish paint termination backboards with durable white enamel under the provisions of Division 9 prior to installation of equipment.
- B. Support raceways and backboards under the provisions of Section 260529.
- C. Install termination backboards plumb, and attach securely to building wall at each corner.
- D. Install #14 gauge steel or approved, 200 lb. nylon cord pull wire in each empty conduit run. The maximum bends between pull points shall be 180 degrees.
- E. The maximum distance between pull boxes shall be 100 feet.

END OF SECTION 270510

## SECTION 271500 - DATA COMMUNICATIONS CIRCUITS

### PART 1 - GENERAL

#### 1.1 SUMMARY

Section includes termination devices, racks, and premises wiring for telephone and data communication circuits by certified manufacturers and contract installers with certification and testing of all equipment and cabling.

- A. Shall conform to Coastal Carolina Community College Telecommunications Department Guidelines.
- B. Shall conform to North Carolina STS-1000 Telecommunications Guidelines, which can be downloaded from the web site <https://files.nc.gov/ncdoa/documents/files/STS1000 ITS.pdf/>

#### 1.2 REFERENCES

The State of North Carolina expects and enforces strict adherence to the latest published versions of the following codes and standards:

1. Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Final Guidelines (July 1991) – 36 CFR Part 1191
2. Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant – TIA / EIA-526 - 14 (OFSTP-14A)
3. Commercial Building Telecommunications Wiring Standard – TIA / EIA-568 - B.1
4. Commercial Building Telecommunications Wiring Standard – TIA / EIA-568 - B.2
5. Commercial Building Telecommunications Wiring Standard – TIA / EIA-568 - B.3
6. Telecommunications Pathways and Spaces – TIA / EIA - 569
7. Residential Telecommunications Cabling Standard – TIA / EIA - 570
8. Optical Fiber Cable Color Coding – TIA / EIA - 598
9. Administration Standard for the Telecommunications Infrastructure of Commercial Buildings – ANSI / TIA / EIA-606
10. Commercial Building Grounding and Bonding Requirements for Telecommunications – TIA / EIA - 607
11. Customer-Owned Outside Plant Telecommunications Standard – TIA / EIA - 758
12. Detail Specification for 62.5- $\mu$ m Core Diameter / 125- $\mu$ m Class 1a Multimode Graded Index Optical Waveguide Fibers – TIA / EIA - 492AAAA
13. Generic Requirements for Optical Fiber and Optical Fiber Cable – Bellcore TR-TSY-000020
14. National Electrical Code (NEC) Articles 600, 700 & 800
15. National Fire Protection Association (NFPA) NFPA - 71, - 72, - 75, - 780.
16. BICSI - Telecommunications Distribution Methods Manual (Newest Edition) Building Industry Consulting Service International
17. BICSI - Customer-Owned Outside Plant Design Manual (Newest Edition) Building Industry Consulting Service International
18. Customer-Owned Outside Plant Telecommunications Cabling Standard TIA / EIA - 758 –

### 1.3 SYSTEM DESCRIPTION

- A. Provide, ready for operation, a complete and operational communication network infrastructure system that is a manufacturer certified 250 MHz, Cat 6A system.
- B. The system shall include, but not be limited to, cabling (copper and fiber optic), modules, patch panels, faceplates, connectors, hardware, accessories, connections, and all other material, labor and operations required for a complete system in this building.
- C. Cabling shall be installed in raceways and/or on a cable support structure as shown on the Drawings. Raceways for cabling shall be installed in compliance with Section 260553. Cable support structure shall be as specified hereinafter.
- D. The horizontal wiring shall consist of the wiring from the telecommunication equipment enclosure to the information services outlet. (The horizontal wiring includes the wiring termination components in the telecommunication room(s), the horizontal wiring itself, and the termination components at the outlet).
- E. Backbone cabling shall consist of fiber and copper cables to connect data services as required and shown on the Drawings.
- F. Horizontal Wiring for Data and Telephone: Unless indicated otherwise on the Drawings, the normal connections requirements to a standard four position telecommunication outlet are two (2) data cables to each outlet. The two data cables shall terminate at the telecommunications room rack designated for data on the manufacturers end-to-end termination Cat 6A hardware.
- G. The system shall be compliant with the Owner's long range strategic development plan to provide for current and future data requirements by a planned end-to-end manufacturer's system, while recognizing the need for future bandwidth and fault tolerance. The proposed system shall utilize a network of fiber optic and unshielded twisted pair (UTP), riser, tie and station cables. Fiber cables shall terminate on Fiber Distribution Centers and/or modular patch panels as shown on the Drawings. Cables and terminations shall be identified at all locations and cables shall terminate in an alphanumeric sequence at all termination locations. The complete system shall be fully standards compliant. Copper and Fiber Optic drops shall be warranted to the link performance as defined by ANSI/TIA-568-C standards. All UTP end-to-end Channel Configurations as defined by ANSI/TIA 568B-1,2,3 shall be provided by a single manufacturer.

### 1.4 SUBMITTALS

- A. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Product Data: Submit catalog data for each termination device, cable, rack, etc.
- C. Test Reports: Indicate procedures and results for specified field testing and inspection.
- D. Reference paragraph 1.7 B below, submit copies of all BICSI RCDD certifications together with picture identification and itemized list of technicians and installers.

## 1.5 CLOSEOUT SUBMITTALS

- A. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Project Record Documents: Record actual locations and sizes of pathways and outlets.
- C. Provide a certificate of completion of the installation with verifications that each copper cable pair has been tested to a minimum of 250 MHz.
- D. Provide a certificate of completion of the installation with verifications that each fiber optic cable has been tested to industry standards.
- E. Provide a Certified Installation Warranty Certificate.
- F. Provide Test results for each cable and outlet.
- G. Provide marked up Drawings showing additions, deletions, and modifications also identifying cable routings.
- H. Provide electronic copies of marked up final Drawings.
- I. Provide wall mounted copies of the final system Drawings in each telecommunications room.

## 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in installing products specified in this section with minimum five years documented experience on projects utilizing infrastructure work similar to that required for this project, and with service facilities within 150 miles of project.
  - 1. The Installer shall be an experienced firm regularly engaged in the layout and the installation of cabling infrastructure systems. Documentation shall be provided to show that the Contractor has successfully completed projects of similar size and scope within the previous twelve months.
  - 2. The Installer shall be manufacturer certified and shall have a current valid certification card.
  - 3. The Telecommunication Project Manager shall:
    - a. be certified as BICSI RCDD
    - b. be experienced in this type of project and provide technical support.
    - c. attend monthly progress meetings and additional meetings as scheduled or required.
    - d. In addition to having the appropriate manufacturer certifications, the installing work force shall wear visible identification badges at the project site showing name, current photograph and company name.
- C. Testing Agency: Company member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years documented experience.

- D. The Manufacturer and Installation Contractor shall also note the requirements of Paragraph 2.1 below.

## 1.7 PRE-INSTALLATION MEETING

Convene minimum one week prior to commencing Work of this section.

## 1.8 REGULATORY REQUIREMENTS

- C. Conform to requirements of NFPA 70.
- D. Furnish Products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.
- E. Shall conform to CCCC Campus Telecommunications Department Guidelines.
- F. Shall conform to North Carolina STS-1000 Telecommunications Guidelines, which can be downloaded from the web site <http://www.its.state.nc.us/>

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. AMP NETCONNECT CAT 6A AND THE CORNING CABLE SYSTEMS LANscape.: Contractor shall be a registered and certified designer and installer.

Note: The Corning solution requires the installers to be a current EWP.

### 2.2 DATA OUTLET JACKS, PATCH PANELS AND PATCH CABLES

- A. Product Description: ANSI/TIA 568B Cat 6A compliant rack-mounted assembly or terminals and accessory patch cords, with adequate capacity for all active and 25% spare circuits.
- B. PATCH CORDS
  - 1. The provision of Patch cords shall be included in the project and provided by the data contractor for the rack end and the work area outlet(s).
  - 2. The patch cords shall be provided to the networking communications department.
  - 3. Installation of the patch cords shall be by CCCC Network Communications when the communications rooms have been accepted by the University and secured.
  - 4. Work Area Outlet - Patch cords shall be provided for the work area outlet. The patch cord lengths shall be sufficient to reach each camera with a 12" spare length loop. Unless otherwise designated by the Network Communications Department. The quantity for the Work area outlets shall be for all Network communications data outlets throughout the Project.
  - 5. Data Equipment Panel - Patch cords shall be provided for each data cable in the data equipment panel.
  - 6. Patch cords shall be from one supplier and match the end to end solution being installed



for the project.

7. Patch cords shall be submitted for review.

- C. Product Description: 8 pin modular jack (RJ45), Cat 6A compliant and conforming to ANSI/TIA 568 requirements for cable connectors for specific cable types. Wire per ANSI/TIA 568B pinout. Provide single gang plates with four (4) jack locations, configured for two (2) data. Each faceplate shall have designated label strips for the top and bottom at each face plate.
- D. Jacks shall be as specified. All installers must be properly trained and certified by the manufacturer to install jacks according to manufacturer specifications.

Circuit	Jack	Color
Data	Cat 6A	Blue

Outlet Faceplates shall match those specified in Section 262726 and shall provide for four jacks.

## 2.3 EXTERIOR CABLES

- A. Network Data Cable shall be Cat 6A 10G OSP installed to the strict ANSI/TIA 568B-1,2,3/569 BICSI and NEC guidelines for the installation of Cat 6A cable, blue in color unless otherwise designated or required by environmental standards.
- B. Cat 6A UTP, 4 Pair (High Performance) OSP cables shall extend between station location and terminal consisting of 4 pair, 100 ohm, 24 or 23 AWG solid conductors, and terminating on 8 pin modular jacks provided at each outlet. Cable jacket shall comply with NEC Article 800 for use as a plenum or non-plenum cable. The 4 pair UTP cable shall be UL® and cUL® Listed Type OSP, as required. The high performance Cat 6A UTP cable shall be of the traditional round design with or without flute. The high performance Cat 6A cable shall be shall be specified to 500 MHz.

## 2.4 EXTERIOR FIBER OPTIC CABLE

- A. Network Data cable shall be gel free OM3, OSP, all-dielectric fiber-optic cable consisting of a minimum 6 strand multimode fiber. Contractor must utilize LC connectors for fiber.
- B. Maximum attenuation for any single fiber between patch panels will not exceed 1.5 db.
- C. All 6 and 12 strand fibers shall terminate in 12 port interconnect panels utilizing LC connectors.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. The project manager and crew shall be consistent through out the project. The project manager shall be present when any work is being performed. The project manager shall contact the Owner designated contact at the beginning and end of each day that work is to be performed.

- B. Cable shall be installed and terminated per manufacturer's specifications. The installer will observe the cabling practices described in ANSI/TIA 568-B. Standard industry practices guided by the ANSI/NECA/BICSI 568-2001 BICSI TDM and BICSI installation manual shall be employed for cable installation, handling, grooming, etc. All cabling will be installed in a manner that will protect the cable from damage during installation, facilitate cable management and identification, and provide a neat and groomed appearance.
- C. Install wire and cable in accordance with ANSI/TIA 568B.1,2,3 and ANSI/TIA 569A.
- D. The maximum bends between pull points shall be 180 degrees.
- E. All penetrations through walls and floors shall be sleeved. All sleeves shall have permanently attached bushings. Sleeves shall be sized to accept 50% growth. All sleeves shall be fire-stopped using UL® approved methods and shall maintain assembly fire ratings. All sleeves between floors shall be supported with a conduit riser clamp installed per the manufacturer direction and shall be installed tight to the ceiling with enough sleeve to attach the bushing and rise up three inches above the floor on the opposite end.
- F. All cable shall be installed in a complete, neat and orderly fashion. Install cable with sufficient bending radius as not to kink, shear or damage binders. Bend radius shall meet manufacturers specifications for horizontal cable, fiber-optic cable, inter- and intra- building cable and copper inter- and intra- building cable. Cables shall be groomed, such that cables to be terminated on the left side of the patch panels are routed down the left side of the rack, and cables to be terminated on the right side of the patch panels are to be routed down the right side of the rack.
- G. Terminate all data and telephone cables at outlet devices. Terminate data cables on specified rack designated by the manufacturer's end-to-end solution equipment. Terminate telephone cables on specified rack using manufacturer's end-to-end solution for Cat 6a.
- H. Rigid conduit or surface mounted raceway as indicated on the plans and specifications shall be used for all drops, flex hose shall not be used. If conditions DO NOT provide for conduit or surface mounted raceway to be used, the Contractor shall coordinate with NET-Com for permission to use alternate raceway.
- I. Install pull wire in each empty telephone or data conduit.
- J. Install #12 AWG tracer wire in all conduits.
- K. Ground and bond pathways, cable shields, racks and equipment under the provisions of ANSI/TIA - 607 - Commercial Building Grounding/Bonding Requirements.
- L. Each end of all Cat 6a cable shall be labeled at approximately 3 to 6 inches from the Network Data jack, and campus wide systems with a printed cable label. Labeling for the faceplate and block terminations shall be provided by the contractor with consultation from the Owner. All labeling shall comply with the ANSI/TIA-606A standard. The ER/TR labeling nomenclature shall match that of the station outlet (SO) identifier as listed below:
- M. All labels for the labeling shall be printed using a computer, printer or Brother P-Touch labeler with TZ tape or equivalent. Labels shall not be hand written. Labels shall be different colors as detailed for identification per the 606A standard. The contractor shall

meet with the Owner and verify the numbering schemes and label coloring.

- N. The general numbering sequence shall conform to a sequential numbering pattern common to all floors of the facility. All cables shall be numbered sequentially from room to room as closely as possible. The final numbering scheme shall be agreed upon between the selected vendor and the building owner prior to the start of the physical installation.
- O. Station outlet labeling shall consist of two components: top faceplate label and a bottom faceplate label. The label shall have a five-character identifier with the format f-y-xxx. Where F= the floor number of the building, y is D for data and xxx is an unique identifier between 0 and 999 for any station outlet on that floor served by the same ER/TR.
- P. ANSI/TIA 606 Administration standards for the Telecommunications Infrastructure of Commercial Buildings is incorporated by reference. Compliance shall be maintained. Each cable record shall indicate the cable type by manufacturer and manufacturer's designation and shall document every pair/conductor in the cable. The cable identifier shall be linked to all pathways in which it runs.
- Q. Each piece of termination hardware such as a patch panel or wiring block shall have an unique named and label. Termination positions on cross-connect shall be identified by type (the pair /conductor terminated and a user code). For each element in the route, identification labels shall be completed and attached. Labels shall meet the requirements of UL969® Standard for Marking and Labeling Systems. A final report shall record system configuration, unique identifier, fiber labels, pathways and as-built details and as-built drawings. Loss Measurements and OTDR traces shall also be included with the records. Color coding to match UL606® requirements.

Cable numbering shall follow the example:

Example: CABLE D.5.2.013

D=DATA

5=TELECOMMUNICATIONS ROOM NUMBER

2=FLOOR NUMBER

013=13<sup>TH</sup> CABLE TO BE INSTALLED

- R. All cables shall be installed according to ANSI/TIA 568B-1,2,3 /569A standards. Care shall be taken during the installation to prevent nicks, abrasions, burning and scuffing of the cable. Cables found to be damaged will be replaced at the contractor's expense regardless of whether the cable passes Cat 6a Level III testing standards.

### 3.2 TESTING

- A. Horizontal Cable Testing:
  - 1. Each equipment telecommunications room patch cord, patch panel, horizontal cable, RJ 45 jack, station patch cord shall be tested end-to-end for compliance with Cat 6a level III parameters as stated in the ANSI/TIA 568 B1, 2, 3/ 569 standards. Only certified Cat 6a cable testing shall be used. The Test equipment used for horizontal Cat 6 cable tests shall be in compliance with the industry standard Cat 6a cable testers level III, and comply with ANSI/TIA test procedures. Each link shall be tested to ANSI/TIA 568-B.
  - 2. Testing of all copper wiring shall be performed prior to system cutover. 100 percent of the horizontal and riser wiring pairs shall be tested for opens, shorts, polarity reversals, transposition and presence of AC voltage. Data horizontal wiring pairs shall be tested from the information outlet to the TR. Cat 6a cable runs shall be tested for conformance to the

specifications of EIA/TIA 568B Annex D.

3. Testing shall be accomplished using a ANSI/TIA TSB-67 UL® Certified Level II-E test set. Test shall include length, mutual capacitance, characteristic impedance, attenuation, and near-end and far-end cross talk and ELFEXT.
4. The contractor, at no charge to the Owner, shall bring any pairs not meeting the requirements of the standard into compliance.
5. Complete, end-to-end test results shall be submitted to the Owner. AMP testing shall follow the same procedure and use the Permanent link test to meet AMP requirements.
6. All cable pairs must be tested for the following conditions in conjunction with or in addition to all ANSI/TIA 568b Cat 6a testing requirements: Polarity, Reversal of pairs, Wire transpositions, Continuity, Opens, Shorts.

B. Fiber Optic Testing:

1. Each 62.5 OR 50/125-micron fiber shall be tested patch panel to patch panel at the 850 and 1300 nm wavelength in both directions using a light meter. Each multi mode fiber shall be tested patch panel to patch panel at the 1310 and 1550 nm wavelength using a light meter. The maximum total attenuation for any single fiber between patch panels shall not exceed 3.0 dB.
2. Power meter tests, for building risers, shall be accomplished for length, attenuation, and micro bends, and for each individual fiber. Test results shall be provided for each individual fiber and maintained for inclusion into the documentation package.
3. Link attenuation does not include any active devices or passive devices other than cable connectors and splices.
4. A final report shall be compiled that records system configuration, fiber labels, cable routes, and as-built details and as-built drawings.

C. A Certified Cat 6a cable tester, Level III, shall perform the certification test on all Cat 6a cables and adhere to ANSI/TIA-568B.

D. All test equipment shall be consistent throughout the installation. All test equipment shall be available for inspection by the Owner at any time. A valid and current calibration certificate traceable to the National Institute of Standards and Technology for any test equipment to be used shall be provided to the Owner.

E. Provide electronic copies only of the computer generated reports of the test results.

### 3.3 FIELD QUALITY CONTROL

- A. Field inspection and testing shall be performed under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Inspect, test and certify all cabling and equipment and terminations as specified and in accordance with ANSI/TIA 568 B.

### 3.4 MANUFACTURER WARRANTY

- A. Contractor shall provide a minimum Twenty Year cabling Extended Product Warranty and Application Assurance. The warranty shall support any performance claims the manufacturer makes over and above the Cat 6a standards stated herein.
- B. A Warranty Statement shall be provided by the Manufacturer stating the period of the

Warranty for all the products specified for the project, the name and address of the authorized manufacturer's agent and also state who shall honor any and all Warranty claims.

- C. Extended Product Warranty shall cover product defects for all passive manufactured channel components. Passive components are defined as those exhibiting no gain or contributing no energy. As from the date of a Registration Certificate the Manufacturer shall Warrant:
  - 1. That the passive products that comprise the registered Channel solution shall be free from manufacturing defects in material or workmanship under normal and proper use;
  - 2. That all channel approved passive cabling products that comprise the registered Channel solution exceed the specification of ANSI/TIA 568-B and exceed ISO/IEC 11801 standards and shall be equal to or exceed the performance specifications of the associated Communication product data sheet in effect at the time the Registration Certificate is issued;
  - 3. That the installation shall meet the insertion and return loss, attenuation and near-end cross talk (NEXT) requirements of ANSI/TIA 568-B and the ISO/IEC 11801 standards for cabling links/channel configurations specified in these standards;
  - 4. That each channel is exclusively comprised of a single manufacturer's solution in accordance with application standards;
  - 5. This extended Product Warranty is applicable to the channel cabling solution products only on the original site of installation. Under the Extended Product Warranty, Manufacturer shall either repair or replace the defective product itself at Manufacturer's cost and, pay an Authorized Cable Installation Reseller for the cost of labor to repair or replace any such defective product on behalf of the Manufacturer; and
  - 6. Corning Cable Systems LANscape solutions "landscape extended warranty" a 25-year warranty on complete fiber optic cabling solutions. The telecom contractor shall be an authorized Corning Cabling Systems extended warranty (EWP) installer
- D. Application Assurance shall cover the failure of the channel structured cabling solution to operate the applications, which the Solution was designed to support, as well as additional application(s) defined below. Manufacturer shall warrant that the registered channel structured cabling solution shall be free from failures which prevent operation of the specific applications for which the original channel structured cabling solution was designed. The Application Assurance Program shall also cover the following additional applications:
  - 1. Those identified in the current (at the time of installation) channel structured cabling solution performance specifications; and
  - 2. In accordance with application standards specifications, any application introduced in the future by recognized standards or user forums that use ANSI/TIA 568-B or ISO/IEC 11801 components and link/channel specifications for cabling.
- E. Other Warranties
  - 1. Additional Warranty: The Contractor shall state any additional Contractor supplied warranty.
  - 2. Self Install Warranty: The Cat 6a structured cabling manufacturers shall provide the Owner with a Self Install Warranty for all future moves, additions and changes to the end-to-end cabling solution provided for this project.

END OF SECTION 271500