

## TABLE OF CONTENTS

### Division 0

|        |                                   |                     |
|--------|-----------------------------------|---------------------|
| 001100 | Invitation to Bid                 | 001100-1 – 001100-2 |
| 002113 | Instructions To Bidders           | 002113-1 – 002113-4 |
| 004100 | Bid Form                          | 004100-1 – 004100-2 |
| 004101 | Trench Safety Addendum            | 004101-1 – 004101-2 |
| 004102 | Drug-Free Workplace Certification | 004102-1 – 004102-2 |
| 004103 | Public Entity Crimes Statement    | 004103-1 – 004103-4 |
| 004300 | List of Subcontractors            | 004300-1 – 004300-2 |
| 004313 | Bid Bond                          | 004313-1 – 004313-2 |
| 005200 | Agreement Forms                   | 005200-1 – 005200-2 |
| 006113 | Performance Bond and Payment Bond | 006113-1 – 006113-2 |
| 007200 | General Conditions                | 007200-1 – 007200-2 |
| 007380 | Weather Delay Log                 | 007380-1 – 007380-2 |
| 007400 | Payment                           | 007400-1 – 007400-2 |
| 009000 | Supplementary General Conditions  | 009000-1 – 009000-4 |

### Division 26

|        |  |                      |
|--------|--|----------------------|
| 260500 | Electrical General Requirements                            | 260500-1 – 260500-6  |
| 260519 | Low Voltage Electrical Power Conductors and Cables         | 260519-1 – 260519-6  |
| 260526 | Grounding and Bonding for Electrical Systems               | 260526-1 – 260526-4  |
| 260529 | Hangers and Supports for Electrical Systems                | 260529-1 – 260529-6  |
| 260533 | Raceways and Boxes for Electrical Systems                  | 260533-1 – 260533-10 |
| 264313 | Surge Protection for Low-Voltage Electrical Power Circuits | 264313-1 – 264313-4  |

**SECTION 00 11 00 - INVITATION TO BID**

Sealed Bids will be received by the District Board of Trustees, Pensacola State College, Building 7, Room 737, 1000 College Boulevard, Pensacola, Florida 32504-8998, **until 2:00 P.M., local time August 6, 2024**, at which time and place all bids will be publicly opened and read aloud, for the construction of:

**BUILDING 2 MAIN GEAR REPLACEMENT  
FOR  
PENSACOLA STATE COLLEGE - MAIN CAMPUS**

For the District Board of Trustees, Pensacola State College, Pensacola, Florida, according to the contract documents, drawings, specifications and general conditions pertaining thereto for the work as prepared by the Engineer:

**HG Engineers  
4286 Woodbine Road  
Pace, FL 32570  
Ph: (850) 243-6723  
Fax: (850) 664-5420**

Any early bids (prior to 1:50 PM, on the Bid Opening Date) shall be delivered to: College Purchasing and Auxiliary Services Office, Building 7, Room 737, on the Pensacola Campus of Pensacola State College.

Any Bids received after the stipulated time of bid opening will be returned unopened.

In the case of discrepancies occurring in stated amounts in the Contractor's Bid, the Owner (District Board of Trustees, Pensacola State College) reserves the right to adopt prices written in words, or to reject the bid.

The general contractors and prime bidders who provide bids may inspect contract Documents, including drawings, specifications and general conditions relative thereto, at the Office of the Architect.

General Contractors and prime bidders may obtain Sets of Printed Documents (drawings and specifications) at their cost from Bay Area Printing and Graphics Solution, 700 S. Pace Blvd., Pensacola, FL 32502 (850-433-6864) after registering with the HG Engineers, 4286 Woodbine Road Pace, FL 32570 (to facilitate distribution of possible addendums and clarifications). General Contractors may also obtain One Electronic Set of Reproducible Documents (drawings and specifications) in person from HG Engineers, 4286 Woodbine Road, Unit D, Pace, FL 32570.

A bid bond or deposit, in the amount of five percent (5%) of the base bid will be required to accompany each bid, as guarantee that the successful bidder, will enter into a contract with the Owner, if desired by same. Any bid deposit must be in the form of a Certified Check, or a Cashier's Check. The bid bond or deposit will be held as liquidated damages, in the event that the successful bidder refuses to enter into a contract with the Owner. In addition, the successful bidder shall provide a one hundred percent (100%) Performance Bond and one hundred

percent (100%) Labor and Material Payment Bond(s), with a surety insurer authorized to do business in the State of Florida as surety, satisfactory to the Owner.

Failure to file a protest within the time prescribed in F.S. 120.57(3), or failure to post the bond or other security as required by F.S. 287.042(2)(c) shall constitute a waiver of proceedings under Chapter 120, Florida Statutes. All protests must be delivered to the Director of Purchasing & Auxiliary Services, Pensacola State College, 1000 College Blvd., Pensacola, FL. 32504 within the time prescribed in Chapter 120, Florida Statutes to be considered valid.

The Owner (District Board of Trustees, Pensacola State College, Florida) reserves the rights to reject any and all bids, to waive informalities in bidding and to accept the bid that embraces such combination of proposals and alternates as may promote the best interest of the Owner.

The bid shall remain in force for thirty (30) days after the time of opening.

In accordance with F.S. 286.011 (1), the bid evaluation committee meeting is scheduled to be held in the Barfield Administration Building, Room 737, on August 6, 2024, at 2:30 PM.

Any person(s) requiring reasonable accommodations, in accordance with the provisions of the Americans With Disabilities Act, for attendance at the scheduled bid opening, shall contact the Office of the Director of Purchasing and Auxiliary Services, at least seventy-two (72) hours in advance of the scheduled bid opening deadline.

A mandatory **pre-bid meeting will be held July 15, 2024, at 9:00 a.m.**, in Building 9 conference room at the College. The purpose of this meeting is to allow all bidders access to the site in order that they may familiarize themselves with all existing conditions that relate to the project.

The contract shall be for General Contractor or Electrical Contractor who shall be responsible for work of all trades.

**END OF SECTION 00 11 00**

## **SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS**

### PROCUREMENT OF DOCUMENTS:

Refer to Section 00 11 00 - Invitation to Bid.

### EXAMINATION OF DOCUMENTS AND SITE:

Bidders shall carefully examine the Bidding Documents, the existing facility and the construction site to obtain first hand knowledge of the existing conditions. Each bidder shall fully inform himself prior to bidding as to all existing conditions and limitations under which the work is to be performed.

### INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS:

Each Bidder shall examine the Bidding Documents carefully; and, no later than seven (7) days prior to the date for receipt of Bids, he/she shall make a written request to the Engineer for interpretation or correction of any ambiguity, inconsistency or error which he may discover. All interpretations or corrections will be issued as addenda. The Engineer and/or Owner will not be responsible for oral clarifications. Only written addenda will become a part of the contract documents. Should any conflicts exist in the contract specifications and/or drawings, the most stringent of the items in conflict shall apply.

### SUBSTITUTIONS:

Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents. No substitution will be considered unless written request has been submitted to and received by the Engineer for approval at least ten (10) days prior to the date for receipt of Bids. In addition to the manufacturers printed literature, each request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance test data and any other data or information necessary for a complete evaluation.

If the Engineer approves any proposed substitution, such approval will be set forth in an addendum. The contractor is responsible for ensuring that the prices provided include all items suitable for this project.

### FAMILIARITY WITH LAWS:

The Bidder shall be familiar with all Federal, State and local laws, ordinances, rules and regulations affecting the work. Ignorance of them on the part of the Bidder shall in no way relieve him from responsibility of complying with the requirements stated therein.

### FLORIDA PRODUCTS AND LABORS:

The Bidder's attention is called to Section 255.04, Florida Statutes, which requires that on public building contracts, Florida products and labor shall be used wherever price and quality are equal.

### BASIS OF BID:

The Bidder shall include with his Bid all unit cost items, quantity estimates and alternates indicated on the Bid Form. Failure to comply may be cause for rejection.

If the Owner wishes to learn the relative or additional construction cost of an alternative use type of material, or an increase or decrease in scope of the project, these items will be defined as alternates and will be specifically described by the Drawings and/or Specifications. Alternates will be listed in the Bid Form in such a manner that the Bidder shall be able to clearly indicate what sums he will add to or deduct from his Base Bid.

Such alternates may or may not be accepted, but if so, it is the intention of the Owner to accept them in any order or combination he chooses and not necessarily in the order listed on the Bid Form.

No segregated Bids or assignments will be considered.

#### PREPARATION AND SUBMISSION OF BIDS:

Bid Form: (Submit in triplicate) Bidders shall submit an original and two copies.

Each Bidder shall use the Bid Form supplied and/or bound herein and indicate his Bid prices thereon in the proper spaces for the entire Work and for the alternatives on which he bids. Any erasures or other corrections in the Bid must be explained or noted over the signature of the Bidder. Bids containing any conditions, or irregularities of any kind may be rejected by the Owner.

#### List of Subcontractors:

The Contractor shall, with his bid, submit to the Owner a list of all his subcontractors. This list shall include each company name, if it is a subcontractor, the character of his work or the materials it supplies, the address and telephone number and the name of the person with whom the Contractor is dealing.

#### Bid Guarantee - Five Percent (5%):

Bids shall be accompanied by a Bid Guarantee which shall be a Bid Bond, Cashier's Check, or Bank Draft, made payable to:

**Pensacola State College**

Such check or bond shall be submitted with the understanding that it shall guarantee that the Bidder will not withdraw his Bid for a period of thirty (30) days after the scheduled closing time for the receipt of Bids; that, in accordance with the form of agreement included as part of the Contract Documents; that the required bond will be given; and that, in the event of the withdrawal of Bid within said period, or failure to enter into Contract and give bond within ten (10) days after he has received notice of acceptance of his Bid, and receipt of Contract Agreement, the Bidder shall be liable to the Owner for the full amount of the Bid Guarantee as representing the damage to the Owner on account of the default of the Bidder in any particular thereof.

The Bid Guarantee shall be returned by mail to all except the three lowest Bidders after the formal opening of Bids. The Owner reserves the right to hold the Bid guarantee of the lowest three Bidders until after they have executed the Contract with the accepted Bidder and the Performance and payment Bond have been certified by the Owner.

If the Owner fails to issue an "Acceptance of Bid" to a Bidder within thirty (30) days after the date of the opening of the Bids, then the Bid Guarantee of any Bidder will be returned upon his request.

#### Submission of Bids:

Submit Bid in an opaque, sealed envelope. Identify the envelope with project name and name of Bidder. Submit in accordance with Invitation to Bid.

#### BIDDER'S QUALIFICATIONS:

1. The apparent successful bidder shall, upon the request of the Engineer, furnish documentation of the following:
  - a. He or She shall meet the Contractor's Qualifications listed in Article 15010.1.

- b. He or She is currently registered with or hold an unexpired Certificate issued by the Florida Construction Industry Licensing Board in accordance with current applicable regulations, Licensing of Construction Industry, Florida Statutes.
  - c. He or She presently maintains a permanent bona fide place of business practicing this type of work and has had the appropriate experience.
  - d. He or She has available, or can obtain, adequate equipment and financial resources to undertake and execute the Contract properly and expeditiously, in accordance with present day practices.
  - e. All subcontractors shall be fully licensed in the State of Florida and shall be bondable. Submit copies of current license and documentation from bonding company showing compliance.
  - f. He or She shall submit with the Bid the enclosed document entitled "Sworn Statement under Section 287.133(3) (a), Florida Statutes. On Public Crimes".
2. The apparent successful bidder shall also, at the request of the Engineer, submit a fully executed "Contractor's Qualification Statement" AIA Document A305. Copies of A305 are available for examination at the office of the Engineer.

#### LICENSE:

In accordance with Chapter 489.113, Florida Statutes, all individuals or entities engaging in and providing construction services shall be licensed in the State of Florida for that activity. This license requirement includes general and sub-contractors.

The successful low bidder shall be required to submit a list of all contractors to be involved in said project with applicable license numbers (see form included in these documents), including a photographic copy of current license certificates. Submittal of proof of license shall be made with, and as a part of signed contract.

Prime Contractor shall submit proof of licensure with the Bid Form. Failure to submit required proof of license shall be cause for Owner to reject bid as non-responsive, and award bid to second lowest qualified bidder.

#### DISQUALIFICATION OF BIDDER:

More than one Bid from an individual, firm, partnership, corporation or association under the same or different names will not be considered. Reasonable grounds for believing that a Bidder is interested in more than one Bid for the same will cause the rejection of all Bids which such Bidder is believed to be interested. Bids will be rejected if there is reason to believe that collusion exists between Bidders. Bids in which the prices are obviously unbalanced may be rejected.

#### MODIFICATION OF BID:

Bid modifications will be accepted from Bidders if addressed to the Owner at the place where Bids are to be received and if received prior to the opening of the Bids. Modifications may be in written or telegraphic form. Modifications will be acknowledged by the Owner before opening of formal Bids.

#### WITHDRAWAL OF BIDS:

Bids may be withdrawn by written or telegraphic request received from Bidders prior to the time fixed for opening. Negligence on the part of the Bidder in preparing the Bid confers no right for the withdrawal of the Bid after it has been opened.

**RECEIPT OF OPENING BIDS:**

Bids will be opened publicly at the time and place stated in the Invitation. The person whose duty it is to open them will decide when the specified time has arrived and no Bids received thereafter will be considered. No responsibility shall be attached to any person for the premature opening of a Bid not properly addressed and identified.

At the time fixed for the opening of Bids, the contents of the Bid Form will be made public for the information of the Bidders and other interested, who may be present either in person or by representative.

**REJECTION OF BIDS:**

The Owner reserves the right to reject any or all Bids when such rejection is in the interest of the Owner, and to reject the Bid of a Bidder, in the Engineer's opinion, who is not in a position to perform the Contract, or whose list of subcontractors is improperly prepared.

**AWARD OF CONTRACT:**

The Contract will be awarded within thirty (30) days to the lowest qualified Bidder, provided his Bid is reasonable and it is in the best interest of the Owner to accept it.

The Owner reserves the right to waive any informality in Bids received when such a waiver is in the best interest of the Owner.

**BUILDING PERMIT:**

A permit will be issued to the Contractor by the Facilities Planning and Construction Department of Pensacola State College.

**SECURITY:**

The Contractor shall be responsible for maintaining security, and the contractor shall be responsible for replacement or repair of items and/or equipment stolen, lost or damaged while the building security is under the care of the Contractor. The Contractor shall be responsible for having a job superintendent present whenever work is in progress. The Contractor shall not change superintendent without the Owners approval.

**SPECIAL POLICY AND PROCEDURES:**

Contractor and subcontractor personnel are not permitted to use the campus facilities.

Smoking is not permitted in any campus facility.

Profane language or improper behavior will result in immediate termination from the construction site.

The Contractor shall erect temporary barricades and fencing as required to keep the unauthorized out of the construction area, and provide signs that read. "This area is a designated construction site; anyone who trespasses on this property commits a felony per Florida Statute 810.09(2d).

**END OF SECTION 00 21 13**

**SECTION 00 41 00 - BID FORM**

TO: **District Board of Trustees  
Pensacola State College, Florida  
1000 College Boulevard  
Pensacola, Florida 32504**

REFERENCE: **BUILDING 2 MAIN GEAR REPLACEMENT  
FOR  
PENSACOLA STATE COLLEGE - MAIN CAMPUS**

Gentlemen:

The undersigned, hereinafter called "Bidder", having visited the site of the proposed Project and having become familiar with the local conditions, nature and extent of the Work, and having examined carefully the drawings and the Project Manual, proposes to furnish all labor, material, equipment and other items, facilities, and services for the proper execution and completion of the above referenced project, in full accordance with the Contract Documents prepared by **HG Engineers 4286 Woodbine Road Pace, FL 32570** in full accordance with the Invitation to Bid, Instruction to Bidders, Agreement, Technical Specification, and all other documents relating thereto on file in the Office of the Architect and if awarded the Contract, to complete said Work within the time limits specified for the following bid price.

**PROVIDE NUMERICAL AND WRITTEN DOLLAR AMOUNTS**

**BASE BID (INCLUDING CONTROLS ALLOWANCE):**

\_\_\_\_\_ (\$ \_\_\_\_\_)  
Dollar Amount Included in Base Bid

There is enclosed a certified check, cashier's check, treasurer's check, bank draft, or Bid Bond in the amount of not less than five percent (5%) of the Base Bid payable to Pensacola State College, as a guarantee for the purpose set out in the Instructions to Bidders.

The bidder hereby agrees that:

- a. The above Proposal shall remain in full force and effect for a period of thirty (30) calendar days after the time of the opening of this Proposal and that the Bidder will not revoke or cancel this Proposal or withdraw from the competition within the said thirty (30) calendar days.
- b. In the event the contract is awarded to this Bidder, the Bidder will enter into a formal written Agreement with the Owner in accordance with the accepted bid within ten (10) calendar days after said agreement is submitted to the Bidder and will furnish to the Owner a Performance Bond and a Labor and Material Payment Bond with good and sufficient sureties, satisfactory to the Owner, in the amount of 100% of the accepted bid, on the forms and terms required in the construction documents. The Bidder further agrees that in the event of the bidder's default or breach of any of the agreements of this Proposal, the bid deposit shall be forfeited as liquidated damages.
- c. The Bidder must agree to commence work within ten (10) calendar days after the written "Notice to Proceed" and substantially complete the work on the substantial completion date. A substantial completion date will be coordinated after the bid is awarded. Bidder must further agree to fully complete the work, including any and all punch list items within thirty (30) calendar days from the date of substantial completion. The number of days allowed for construction includes an allowance for time missed due to inclement weather.
- d. Liquidated damages shall be assessed against the final payment in the amount of \$1,000 for each consecutive calendar day the Contractor is late in achieving Substantial Completion and \$500 for each consecutive day the Contractor is late in achieving Final Completion.

- e. The Contractor shall list on a separate page the 'List of Subcontractors' and submit the list with his bid as required by 00 21 13, Page 2.
- f. All work shall comply with applicable codes, specifications, local ordinances and industry standards including, but not limited to the handling, removal, and disposal of fluorescent bulbs and ballasts. Provide Pensacola State College with a copy of the "Waste Manifest".

Acknowledgment is hereby made or receipt to the following Addenda issued during the bidding period.

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_

Florida Construction Industries Licensing Board Certification

\_\_\_\_\_  
 (Name of Holder)  
 (Certification Number)

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

Check accordingly: Firm Name: \_\_\_\_\_

We operate as \_\_\_\_\_

Individual Owner ( ) By: \_\_\_\_\_

Partnership ( ) Title: \_\_\_\_\_

Corporation ( ) Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Telephone: \_\_\_\_\_ FAX: \_\_\_\_\_

Attachments:

- 00 41 01 – TRENCH SAFETY ADDENDUM
- 00 41 02 – DRUG-FREE WORKPLACE CERTIFICATION
- 00 41 03 – PUBLIC ENTITY CRIMES STATEMENT
- 00 43 00 – LIST OF SUBCONTRACTORS
- 00 43 13 – BID BOND

**END OF SECTION 00 41 00**

**SECTION 00 41 01 – TRENCH SAFETY ADDENDUM**

Contractor shall comply with the FLORIDA TRENCH SAFETY ACT ACKNOWLEDGEMENT. If this project involves trench excavations that will exceed a depth of 5 feet, pursuant to Florida Statutes, Chapter 553, Part VI, Trench Safety Act will be in effect and the undersigned Bidder hereby certifies that such Act will be complied with during the construction of this Project.

Bidder acknowledges that included in the various items of the bid and in the total price are costs for complying with the Florida Trench Safety Act. Bidder further identifies the cost to be as summarized below:

| Trench Safety Measure<br>(Description) | Units of Measure<br>(SY) | Quantity | Unit Cost | Extended cost  |
|--|--------------------------|----------|-----------|----------------|
| A. _____                               |                          |          |           |                |
| B. _____                               |                          |          |           |                |
| C. _____                               |                          |          |           |                |
| D. _____                               |                          |          |           |                |
|  |                          |          |           | Total \$ _____ |

**END OF SECTION 00 41 01**

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## **SECTION 00 41 02 – DRUG-FREE WORKPLACE CERTIFICATION**

- A. A copy of the Drug Free Certification form is included in these bid documents as required by the Pensacola State College Board of Trustees.
- B. A copy of the Drug-Free Certification form is contained herein. The completed form must be submitted in the bid submittal along with the other required documents.

**DRUG-FREE WORKPLACE CERTIFICATION**

The below signed bidder certifies that it has implemented a Drug-Free Workplace Program. In order to have a Drug-Free Workplace Program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling rehabilitation and employee assistance programs and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under proposal a copy of the statement specified in subsection 1.
4. In the statement specified in subsection 1., notify the employees that, as a condition of working on the commodities or contractual services that are under proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation occurring in the workplace no later than five (5) working days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in drug abuse assistance or rehabilitation program of such is available in the employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I certify that this firm complies fully with the above Drug-Free Workplace requirements.

DATE: \_\_\_\_\_

COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_ ZIP CODE: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

NAME (PRINTED): \_\_\_\_\_

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

**END OF SECTION 00 41 02**

**SECTION 00 41 03 - PUBLIC ENTITY CRIMES STATEMENT**

- A. The following information is included in these bid documents as required by Florida Statute.
- B. All invitations to bid as defined by Section 287.012(11), Florida Statutes; requests for proposals as defined by Section 287.012(16), Florida Statutes; and any contract document described by Section 287.058, Florida Statutes, shall contain a statement informing persons of the provisions of paragraph (2)(a) of Section 287.133, Florida Statutes.
- C. A copy of the Sworn Statement form is contained herein. The completed form shall be submitted in the bid submittal along with the other required documents.

**SWORN STATEMENT UNDER SECTION 287.133 (3) (A)**

**FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal or Contract for

2. This sworn statement is submitted by  
whose business address is

and (if applicable) Federal Employer Identification Number (FEIN) is \_\_\_\_\_ (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement:

3. My name is \_\_\_\_\_ and my relationship to the entity named above is

4. I understand that a "public entity crime" as defined in Paragraph 287.133 (1) (g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or any agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

5. I understand that "convicted" or "convicted" as defined in paragraph 287.133 (1) (b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime with or without an adjudication of guilt, in any federal or state trial court of records relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.

6. I understand that an "affiliate" as defined in Paragraph 287 .133 (1) (a), Florida Statutes, means:

1. A predecessor or successor of a person convicted of a public entity crime; or

2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term " affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under an length agreement, shall be a prima facie case that one person controls another person. A person who knowingly convicted of a public entity crime, in Florida during the preceding 36 months shall be considered an affiliate.

7. I understand that a "person" as defined in paragraph 287 .133 (1) (e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

\_\_\_\_\_ Neither the entity submitting this sworn statement, nor any officers, directors, executive, partners, shareholders, employees, member, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

\_\_\_\_\_ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989 And (please attach a copy of the final order)

\_\_\_\_\_ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted vendor list. (please attach a copy of the final order.)

\_\_\_\_\_ The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by, or pending with, the department of General Services.)

(Signature)  
Date:

STATE OF FLORIDA  
COUNTY OF

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this day of \_\_\_\_\_, 20\_\_, and is personally known to me, or has provided \_\_\_\_\_ as identification.

Notary Public

My Commission expires:

**END OF SECTION 00 41 03**

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### SECTION 00 43 00 - LIST OF SUBCONTRACTORS

(List of Sub-Contractor's proposed for this project will be required at time of bidding.

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This list is an integral part of the Bid submitted by:

Name and address of Contractor: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

for the construction of the **Building 2 Main Gear Replacement**  
Pensacola State College District Board of Trustees, Pensacola State College.

The undersigned, hereafter called "Bidder", lists below the names of the subcontractors who will perform the phases of the work indicated:

| <u>Division:</u>   | <u>Name of Subcontractor:</u> |
|--------------------|-------------------------------|
| Concrete Work      | _____                         |
| Structural Steel   | _____                         |
| Carpentry          | _____                         |
| Acoustical Ceiling | _____                         |
| Painting           | _____                         |
| Fire Protection    | _____                         |
| Plumbing           | _____                         |
| Mechanical         | _____                         |
| Electrical         | _____                         |
| Fire Alarm         | _____                         |

The undersigned declares that he/she has fully investigated each subcontractor listed and has determined to his/her own complete satisfaction that such subcontractor maintains a fully equipped organization, capable, technically and financially, of performing the pertinent work, and that he/she has made similar installation in a satisfactory manner.

FIRM: \_\_\_\_\_  
(Name of Firm)

BY: \_\_\_\_\_  
(Signature of Bidder)

\_\_\_\_\_  
(Name of Bidder)

TITLE: \_\_\_\_\_  
(Title of Bidder)

DATE: \_\_\_\_\_

**END OF SECTION 00 43 00**

**SECTION 00 43 13 – BID BOND**

- A. The “Bid Bond”, The American Institute of Architect’s (AIA) Document A310-1970, 1970 Edition, two (2) pages, and (AIA) Document D401 – 2003 “Certification of Document’s Authenticity,” one (1) page is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request,

**END OF SECTION 00 43 13**

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## **SECTION 00 52 00 – AGREEMENT FORMS**

The “Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum,” The American Institute of Architects (AIA) Document A101-2007, is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request.

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**SECTION 00 61 13 – PERFORMANCE BOND AND PAYMENT BOND**

- A. The “Performance Bond” and the “Payment Bond”, The American Institute of Architect’s (AIA) Document A312-1984, 1984 Edition, seven (7) pages, “Additions and Deletions Report for AIA Document A312 – 1984,” one (1) page and (AIA) Document D401 – 2003 “Certification of Document’s Authenticity,” one (1) page, is for reference only. Copy upon request.

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## **SECTION 00 72 00 – GENERAL CONDITIONS**

The “General Conditions of the Contract for Construction” The American Institute of Architects (AIA) Document A201-2007, is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request.

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## SECTION 00 73 80 - WEATHER DELAY LOG

- A. **Project: Pensacola State College Building 2 Main Gear Replacement**
- B. **Date:**
- C. **Weather Event:**
- D. **Work On Progress:**
- E. **Is the work on the Critical Path?**
- F. **Length of Delay:**
- G. **If the work is not on the Critical Path, how many days of delay until this work category will be on the Critical Path?**

### Instructions:

1. The above information is required to be submitted with each payment request on a monthly basis.
2. This information will be required as back-up to grant a Time Extension request for delays caused by weather events.
3. Direct delays for work stoppages that are on the critical path will be given accordingly.
4. Delays for work not on the critical path shall be logged and delay logs for that category of work shall be accumulated and submitted in the event the work enters the critical patch and causes a delay of the project.
5. Delays will be granted only on the basis of adverse effect on the Critical Path of work for the project.
6. Weather delays will only be allowed in regards to delivery and unloading of the equipment. Furthermore, weather delays will only be allowed if the rainfall exceeds 1.5" of rain per day as determined by the Mobile Weather Service.

### References:

#### **CONTRACT FOR CONSTRUCTION, EXHIBIT C, DIVISION 1 (CONTRACT)**

8. Any time or day lost to a weather-related delay including wet ground conditions, rain, other forms of precipitation, and cold weather conditions, shall be an extension to the construction time regardless whether the period is under normal or adverse weather conditions.

#### **GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION – A201**

Article 4.3.7.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

**Submitted by:**

**Signature:**

**Contractor:**

**END OF SECTION 00 73 80**

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**SECTION 00 74 00 – PAYMENT**

The “Payment”, The American Institute of Architect’s (AIA) Document G702-1992 Edition, one (1) page, G703-7992 Edition, one (1) page and G704–2000 one (1) page, included herein and shall be used, on this Project for application and process of payment is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request.

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## SECTION 00 90 00 - SUPPLEMENTARY GENERAL CONDITIONS

SCOPE: The following supplements modify, change, delete or add to the "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION", AIA Document A201, 2007 Edition. Those portions of this document which remain unaltered by these supplements shall remain in effect as published.

### ARTICLE 1: GENERAL PROVISIONS

#### 1.1 BASIC DEFINITIONS

1.1.9 (ADD) Unless otherwise expressly stated, wherever in the Contract Documents the work 'provide' is used, it shall mean furnished and installed in place, complete and tested.

#### 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.4 (ADD) the following: "If a discrepancy occurs on drawings, in specifications, or between drawings and specifications, the greater quantity or value takes precedence."

### ARTICLE 3: CONTRACTOR

#### 3.5 WARRANTY:

3.5.1 (ADD) The warranty herein guarantees the proper operation of all structures, components and systems constructed or installed by the contractor for a period of one year after the date of substantial completion.

If within the guarantee period, repairs or changes are required in connection with the guarantee work, which in the opinion of the Architect is rendered necessary as the result of the use of materials, equipment, or workmanship, which are defective, or inferior, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, proceed to:

Place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and

Make good all damages to the structure or site, or equipment or contents thereof which, in the opinion of the Architect are the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, or the equipment and contents or structures or site disturbed in fulfilling any such guarantee.

#### 3.18 INDEMNIFICATION:

3.18.1 (REVISE) "The Contractor shall, for the sum of one hundred dollars (\$100.00) and other good and valuable consideration paid by the Owner and Architect, individually, receipt of which is hereby acknowledged by the Contractor, indemnify and hold harmless the Owner and Architect and their agents and employees from and against all claims, damages, losses and expenses, including attorney's fees, out of or resulting from the performance of the work provided that such claims, damage, loss or expense: (1) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property other than the work itself, including the loss of use resulting therefrom, and (2) is caused in whole or in part by a negligent act or omission of the Contractor, subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any one of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. This obligation shall not be construed to reduce or negate any other right or obligation of indemnity which would otherwise exist as to any party or

person described in Paragraph 3.18.”

## ARTICLE 5: SUBCONTRACTORS

### 5.2.2 Substitute the following for Subparagraph 5.2.2:

"The Contractor shall not contract with any person or entity declared ineligible under Federal laws or regulations from participating in federally assisted construction projects or to whom the Owner or the Architect has made reasonable objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to contract with anyone to whom has a reasonable objection."

## ARTICLE 7: CHANGES IN WORK

### 7.1 General

#### 7.1.1 (ADD) "Maximum percentages of overhead and profit which may be added by the Contractor to actual costs of such changes in the work are specifically set forth as follows:

For all work done by his organization, or subsidiaries of his organizations, including work traditionally considered as subcontractor work, the Contractor may add 15% of his actual costs for combined overhead and profit.

For any work performed by a subcontractor or forces under the respective subcontractor including any sub-subcontractors or persons not in the direct employ of the subcontractor, a total of 15% of the cost of the change, with 10% to be assigned to the subcontractor and any forces under him and the General Contractor may add 5% of the above subcontractor's cost for his overhead and profit.

The above percentages shall be considered reasonable allowance for overhead and profit due to the contractor.

The Contractor shall submit receipts or other evidence showing his costs and his right to the payment claims. All changes in work shall be provided with a detailed cost breakdown indicating material and labor units for all work to be performed. In addition, the cost breakdown shall contain all current tax and labor burden. The allowable amount for the material tax shall be 7.25% and for labor burden shall be 30%.

## ARTICLE 11: INSURANCE AND BONDS

### 11.1 CONTRACTORS LIABILITY INSURANCE

#### 11.1.2 (ADD) "The Contractor shall not commence any work in connection with this agreement until he has obtained all of the following types of insurance with the Owner as additional named insured and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor to commence work on his subcontract has been obtained and approved.

All insurance policies shall be with insurers qualified and doing business in Florida.

THE CONTRACTOR SHALL PROCURE AND MAINTAIN FOR THE LIFE OF THIS CONTRACT:

1. Workers Compensation and Employers' Liability as follows:
  - a. WC Statutory Limits per FS 440
  - b. E.L. - Each Accident \$500,000
  - c. E.L. Disease – Each Employee \$500,000
  - d. E.L. Disease – Policy Limit \$500,000
2. Comprehensive General Liability with minimum limits as follows:
  - a. Each Occurrence - \$ 1,000,000
  - b. Damage to Rented Premises (Each occurrence )- \$100,000
  - c. Medical Expense (Any one person) \$5,000
  - d. Personal Advertising Injury - \$1,000,000
  - e. General Aggregate - \$2,000,000
  - f. Products-Completed Aggregate - \$2,000,000
  - g. General Aggregate applies to Per Project
3. Automobile Liability providing coverage on any auto to include all owned, hired and non-owned vehicle with following minimum limits:
  - a. Combined Single Limit (Each Accident) - \$1,000,000 OR
  - b. Bodily Injury per person - \$500,000, Bodily Injury per Accident - \$1,000,000, Property Damage per Accident - \$500,000
4. Excess/Umbrella Liability on Occurrence Form with following limit:
  - a. \$1,000,000 each occurrence
  - b. \$2,000,000 aggregate
  - c. Retention /Deductible - \$5,000

11.1.2 (ADD) "The Contractor liability policy shall provide "XCU" (Explosion, Collapse, Underground Damage) coverage for those classifications in which they are included.

Broad Form Property Damage shall be required on Contractor's public liability so that completed operations coverage extends to work performed by the Contractor.

11.1.5 (ADD) Builders Risk Insurance: Contractor shall purchase and maintain in effect a completed value builder's risk policy issued by an admitted carrier in an amount equal to the full completed value of the project. Such insurance shall be issued on an all risk form. The Contractor shall be responsible for any deductible amounts.

11.4.3 (ADD) The Contractor shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum or in a penal sum not less than that prescribed by State, Territorial or local law, as security for the payment of persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The Performance Bond and the Labor and Material Payment Bond may be in one or in separate instruments in accordance with local law and shall be delivered to the Owner not later than the date of execution of the Contract. The premium for the required bonds shall be paid by the Contractor. "These bonds shall be executed on behalf of the Contractor in the same manner and by the same person who executed the agreement.

11.4.4 (ADD) "To be acceptable as surety on Performance and Payment Bonds, a surety

company shall comply with the following provisions:

The Surety Company must be admitted to do business in the State of Florida. The surety Company shall have been in business and have a record of successful continuous operations for at least five years. The Surety Company shall have at least the following minimum ratings:

| Contract Amount       | Policy Holders | Required Rating |
|-----------------------|----------------|-----------------|
| 0 - 100,000           | B              | CLASS VII       |
| 100,000 - 500,000     | A              | CLASS VIII      |
| 500,000 - 750,000     | A              | CLASS IX        |
| 750,000 - 1,000,000   | A              | CLASS X         |
| 1,000,000 - 1,250,000 | A              | CLASS XI        |
| 1,250,000 - 1,500,000 | A              | CLASS XI        |
| 1,500,000 - 2,000,000 | A              | CLASS XII       |
| 2,000,000 - 2,500,000 | A              | CLASS XII       |

\*From Best's key rating guide.

Best's Policy Holder's Rating of "A" and "B" (which signifies A--Excellent, and B-Good, based upon good underwriting, economic management, adequate reserves for undisclosed liabilities, net resources for unusual stock and sound investment) or an equivalent rating from the Insurance Commissioner, if not rated by Best's. Neither the Surety Company nor any reinsurer shall expose itself to any loss on any one risk in an amount exceeding ten (10%) percent of its surplus to policyholders.

In the case of a surety insurance company, there shall be deducted in addition to the deduction for reinsurance, the amount assumed by any co-surety, the value of any security deposited, pledged or held subject to the content of the Surety and for the protection of the Surety."

Furnish in triplicate a Performance Bond and a Payment Bond, each in the amount of 100% of the Contract Sum, written by a surety licensed to do business in the state where the Project is located. The prescribed form of the Performance Bond and Payment Bond is AIA Document A313.

ARTICLE 15: CLAIMS AND DISPUTES

15.4 ARBITRATION- Delete sections 15.4 through 15.4.4.3 in their entirety.

**END OF SECTION 00 90 00**

## SECTION 260500 - ELECTRICAL GENERAL REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

The Electrical General Requirements are supplementing and applicable to Division 26 Sections and shall apply to all phases of work specified herein, shown on the Drawings, or required to provide a complete installation of electrical systems. Section 26 is sub-divided for convenience only.

A. This Section includes the following:

1. Job Conditions
2. Regulatory Requirements
3. Electrical equipment coordination and installation.
4. Submittals, Operating and Maintenance instructions and As-built drawings.
5. Common electrical installation requirements.
6. Warranty of work.

#### 1.2 JOB CONDITIONS:

- A. Site Inspections: Before submitting proposals, each bidder should visit the site and fully familiarize himself with all job conditions and shall be fully informed as to the extent of his work. No consideration will be given after bid opening date for alleged misunderstanding as to the requirements of work involved in connecting to the utilities or as to requirements of materials to be furnished. The contractor shall contact the utility prior to bid and make appropriate provisions in such bid as required by the utility for the utility's routing and connection.
- B. Scheduled Interruptions: Planned interruptions of utilities service, to any facility affected by this contract, shall be carefully planned and approved by Engineer at least ten (10) days in advance of the requested interruption. The Contractor shall not interrupt services until the Engineer has granted specific approval. The request shall indicate services to be affected, date and time of interruption and duration of outage. Request for interruption of service will not be approved until all equipment and materials required for the completion of that particular phase of work are on the job site. The work may have to be scheduled after normal working hours.
- C. Accidental Interruptions: All excavation and/or remodeling work required shall be performed with care so as not to interrupt other existing services (water, gas, electrical, sewer, sprinklers, etc.). If accidental utility interruption resulting from work performed by the Contractor occurs, service shall be immediately restored to its original condition without delay, by and at the expense of the Contractor, using skilled workmen of the trade required.

#### 1.3 REGULATORY REQUIREMENTS:

- A. Permits, Fees, and Inspections: This Contractor shall secure and pay for all permits, and inspections required on work performed under this section of the Specifications. He shall assume full responsibility for all assessments and taxes necessary for the completion and acceptance of the work.
- B. Applicable Standards and Codes: The electrical installation shall comply with all applicable building codes; local, state, and federal ordinances. In case of a discrepancy among these applicable regulatory codes and ordinances, the most stringent requirement shall govern. The Contractor shall notify the

Engineer in writing of any such discrepancy. Should the Contractor perform any work that does not comply with the applicable regulatory codes and ordinances he shall bear all cost arising in correcting the deficiencies. Application standards and codes shall include all local ordinances, all state laws, and the applicable requirements of the following:

1. American National Standards Institute - ANSI
2. National Electrical Manufacturer's Association - NEMA
3. National Fire Protection Association – NFPA (latest editions)
4. Florida Building Code – 2023 Edition
5. Underwriters' Laboratories, Inc. – UL
6. The National Electrical Code – NFPA 70, 2020 Edition
7. The Life Safety Code – NFPA 101, 2021 Edition
8. The National Fire Alarm and Signaling Code – NFPA 72, 2019 Ed.

- C. Drawings and Specifications: The drawings and these specifications are complementary each to the other. What is called for by one shall be as binding as if called for by both. Omissions from the drawings and specifications of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such work. In any case of discrepancy in the figures or catalog numbers, the matter shall be submitted to the Engineer, who shall promptly make a determination in writing. Any adjustment by the Contractor shall be at the Contractor's own risk and expense. Electrical drawings are diagrammatic only. Do not scale these drawings. All equipment shall be installed in accordance with manufacturer's recommendations and any conflicting data shall be verified before bidding.
- D. The Contractor shall after completion of the work, furnish the Engineer a certificate of final inspection and approval from the applicable local inspection department. The Contractor shall also make necessary changes to plans and specifications to meet code standards at no additional cost to the Owner.

#### 1.4 CONNECTION TO EXISTING UTILITIES:

- A. All utility work shall be coordinated with and approved by the local providing utility. Permission for all utility outages shall be requested a minimum of (10) days in advance unless an emergency arises. Explicit detail shall be shown for all connections to existing utilities. The applicable utility company must approve both the location and the method of the proposed connection.
- B. The contractor shall coordinate procedure to, and shall pay for, all electric energy consumption during construction as part of the project.
- C. The contractor shall include the electric utility connection fee in the bid unless specifically directed by Owner not to do so. If, prior to bid, the electric utility connection fee is unknown, the Contractor shall include \$25,000 as a line item in the bid for each service. Once the utility connection fee is known, if the utility connection fee is less than \$25,000, the balance shall be removed from the Contractor's total contract price.

#### 1.5 COOPERATION:

- A. Interfacing with Other Crafts: It shall be the responsibility of the Contractor to cooperate and coordinate with all other crafts working on this project. This Contractor shall do all cutting, trenching, backfill and structural removals to permit entry of the electrical system components. The Contractor shall do all patching and finishing.

**1.6 WORKMANSHIP:**

All work shall be executed in a neat and substantial manner by skilled workman, well qualified, and regularly engaged in the type of work required. Substandard work shall be removed and replaced by the Contractor at no cost to the Owner.

**1.7 APPROVAL OF MATERIALS AND EQUIPMENT:**

Prior-Submittals: The Contractor shall base his proposal on the materials specified herein and on the drawings. Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar design. The Specifying Engineer reserves the sole right to decide the equality of materials proposed for use in lieu of these specified. It shall be the Contractor's responsibility to furnish the information and data sufficient to establish the quality and utility of the items in question, including furnishing of samples if required. If other equipment manufacturers determine that their equipment will fit in the space and meet the recommended clearances, suit all job conditions, equal or exceed the quality of the specified items, then a request may be made in writing to the Specifying Engineer at least ten (10) business days prior to bid date for permission to be included in the approved equipment list. All data required for evaluation shall accompany the above letter. The Specifying Engineer offers two submittal reviews, if these are unacceptable, only an "as-specified" submittal will be accepted. In addition, all value engineering alternates should only be submitted when directly requested by the owner and must be noted specifically as "VE" alternates to the items specified in the construction documents. A letter from the owner directing the VE effort is strongly encouraged as an accompaniment to any VE submittal.

**A. Submittals:**

1. **Submittals:** The Contractor shall submit a list of equipment proposed for installation. Catalog data and shop drawings on all proposed systems and their components shall be submitted. Where substitutions alter the design or space requirements, the Contractor shall defray all items of cost for the revised design and construction including costs to all allied trades involved. Provide six (6) copies of submittals and shop drawings as a minimum unless the General Conditions requires a greater number of copies. In lieu of paper copies, the Contractor may submit the submittals in PDF format.
  - a. **Submittals Schedule:** Submittals shall be submitted within thirty (30) days after the contract is awarded. It is not the responsibility of the Engineer to expedite the review of submittals if the contractor has not adequately prepared the submittals in a time efficient manner. The contractor bears all the responsibility for the added time requirements of resubmittals.
  - b. **Identification:** Place a permanent label or title block on each submittal for identification. Each major section of submittals such as power equipment, lighting equipment, fire alarm, etc., shall be secured together in a booklet or stapled with a covering index. The different parts of the submittal shall describe which Specification Section it is referenced. The covering index shall list the following information:
    - 1) Project name and date
    - 2) Name, address, and phone number of General contractor and project manager.
    - 3) Name, address, and phone number of Sub-contractor and project manager.
    - 4) Supplier of equipment with phone number and person responsible for this project.
    - 5) Index of each item covered in submittal and model number.

- 6) Any deviation from contract documents shall be specifically noted on submittal cover index and specifically identified with highlighting, encircling, or boldly on specific submittal sheet.
- c. The submittal shall not be in individual parts per each Specification Section but be combined as a part of a major section such as power equipment, lighting equipment, fire alarm, methods, etc.
- d. Resubmittals: The Specifying Engineer will participate in two resubmittal reviews. After the second resubmittal review, the Engineer shall not review the submittal until the Contractor provides \$1,000 to the Engineer to perform each additional required resubmittal review. Make resubmittals in same form and number of copies as initial submittal.
  - 1) Include previous submittal review comments.
  - 2) For each item being resubmitted, include previous review comment and explain how resubmitted item meets the criteria of the previous review comment.

2.

#### 1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protection: Take necessary precautions to protect all material, equipment, apparatus, and work from damage. Failure to do so to the satisfaction of the Engineer will be sufficient cause for the rejection of the material, equipment, or work in question. Contractor is responsible for the safety and good condition of the materials installed until final acceptance by the owner.
- B. Cleaning: Conduit openings shall be capped or plugged during installation. Fixtures and equipment shall be tightly covered and protected against dirt, moisture, chemical and mechanical injury. At the completion of the work the fixtures, material and equipment shall be thoroughly cleaned and delivered in condition satisfactory to the Engineer.

#### 1.9 TESTING AND BALANCING:

Make tests that may be required by the Owner or the Engineer in connection with the operation of the electrical system in the buildings. Balance all single-phase loads connected to all panelboards in the buildings to insure approximate equal divisions of these loads on the main secondary power supply serving the buildings. All tests shall be made in accordance with the latest standards of the IEEE and the NEC. The installation shall be tested as defined in the 26 specifications. Contractor shall perform circuit continuity and operational tests on all equipment furnished or connected by Contractor. The tests shall be made in the presence of the Engineer or his representative. The Contractor shall notify the Engineer at least twenty-four (24) hours in advance of tests. The Contractor shall provide all testing equipment and all costs shall be borne by him. Written reports shall be made of all tests and shall be made available at the Pre-Final Inspection. All faults shall be corrected immediately.

- A. A letter shall be written giving the following:
  - 1. Measured amps on each phase of each panel.
  - 2. Resistance to ground of each new grounding electrode.
  - 3. Measured voltage phase to phase and phase to neutral at each panel.
  - 4. Ground continuity and polarity instrument used.

#### 1.10 OPERATING AND MAINTENANCE INSTRUCTIONS/AS BUILT DRAWINGS:

- A. Four (4) complete sets of instructions containing the manufacturer's Operating and Maintenance (O&M) instructions for each piece of equipment shall be furnished to the Owner. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time that the test procedure is submitted, and remaining sets shall be furnished before the Contract is completed. Flysheets shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2" by 11" with large sheets of Drawings folded in. The instructions shall include information for major pieces of equipment and systems. In addition, a CD shall be provided to the Owner with the O&M Manuals and Drawings contained therein.
- B. This Contractor shall provide as-built Drawings at the completion of the job. Drawings shall show all significant changes in equipment, wiring, routing, location, etc. All underground conduit routing shall be accurately indicated with locations dimensioned. As-built drawings shall be submitted for review as red-lined on a field hard copy (digitally edited PDF documents are also acceptable).
- C. All signals, communications, data, control, dimming systems, etc. shall be included in the As-Built drawings. Where electrical drawings contain a large number of items that prevent easy discernment of the As-Built system, enlarged details or other graphic methods shall be used to clarify the identification required for As-Built usage.
- D. As-Built drawings shall include the following information:
  - 1. Stub-out locations dimensioned from permanent building lines.
  - 2. Routing of all main feeders and identified as under slab, in slab, above ceiling, etc. also for lighting and power branch circuits the number of conductors shall be included, and for feeders and motor branch circuits the number, size, and insulation of conductors shall be included.
  - 3. Corrected panel board and equipment schedules.
  - 4. Corrected circuit numbers as they appear on the panel board directories.
  - 5. Corrected motor horsepower and full load amperes.
  - 6. Location of major distribution open junction boxes with 2" conduit and over.
  - 7. Location of all underground raceways or duct banks dimensioned from easily identified points with depth indicated from BFG (below finished grade) and by elevation in feet.

#### 1.11 GUARANTEE AND SERVICE:

- A. Upon completion of all tests and acceptance, the Contractor shall furnish the Owner a written guarantee covering the electrical work done for a period of one (1) year from date of acceptance. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Upon notice from the Engineer or the Owner, the Contractor shall, during the guarantee period, rectify and replace any defective material or workmanship and repair any damage caused thereby without additional cost.

## PART 2 - EXECUTION

### 2.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1-2015.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to raceways and piping systems installed at a required slope.

END OF SECTION 260500

## SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Aluminum building wire rated 600 V or less.
3. Connectors, splices, and terminations rated 600 V and less.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

### PART 2 - PRODUCTS

#### 2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated, and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Alpha Wire Company.
  2. General Cable Technologies Corporation.
  3. Okonite Company (The).
  4. Southwire Company.
- C. Standards:
  1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
  2. RoHS compliant.
  3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- E. Conductor Insulation – All types may not be indicated below, coordinate with Drawings and intended uses:
  - 1. Type NM: Comply with UL 83 and UL 719.
  - 2. Type RHH and Type RHW-2: Comply with UL 44.
  - 3. Type USE-2 and Type SE: Comply with UL 854.
  - 4. Type THHN and Type THWN-2: Comply with UL 83.
  - 5. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
  - 6. Type XHHW-2: Comply with UL 44.

## 2.2 ALUMINUM BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn aluminum current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Allowed Use Locations: Aluminum conductors may only be used on feeder or distribution circuits larger than 100A. The Drawings typically indicate all conductor sizes in copper. The contractor shall provide a cross reference table for engineer approval prior to any conductor to be substituted with an aluminum conductor.
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Alpha Wire Company.
  - 2. General Cable Technologies Corporation.
  - 3. Okonite Company (The).
  - 4. Southwire Company.
- D. Standards:
  - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
  - 2. RoHS compliant.
  - 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- E. Conductors: Aluminum, complying with ASTM B800 and ASTM B801.
- F. Conductor Insulation – All types may not be indicated below, coordinate with Drawings and intended uses:
  - 1. Type NM: Comply with UL 83 and UL 719.
  - 2. Type RHH and Type RHW-2: Comply with UL 44.
  - 3. Type USE-2 and Type SE: Comply with UL 854.
  - 4. Type THHN and Type THWN-2: Comply with UL 83.
  - 5. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
  - 6. Type XHHW-2: Comply with UL 44.

### 2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc diecast with set screws, designed to connect conductors specified in this Section.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper for feeders smaller than No. 3 AWG; copper or aluminum for feeders No. 3 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Walls and Partitions: Type THHN/THWN-2, single conductors in raceway.
- E. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- F. Feeders in Cable Tray: Type THHN/THWN-2, single conductors in raceway or Type RHW-2/USE-2 if exterior located.
- G. Exposed Branch Circuits, Including in Crawlspace: Type XHHW-2, single conductors in raceway.
- H. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC.
- I. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according as required by other Specification sections."

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.
- D. Prior to conduit/conductor routing to outlets, contractor shall request final verification of locations. Outlets shall be allowed to be moved 10 feet prior to installation with no cost change.
- E. Comply with requirements in accompanying Section on Fire Alarm Systems for connecting, terminating, and identifying wires and cables.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to requirements in accompanying Sections in this book of Specifications.
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

### 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in accompanying Sections in this book of Specifications.

### 3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to requirements in accompanying Sections in this book of Specifications.

END OF SECTION 260519

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## SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

#### 1.2 ACTION SUBMITTALS

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

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

### PART 2 - PRODUCTS

#### 2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

#### 2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Burndy; Part of Hubbell Electrical Systems.
  2. ERICO; a brand of nVent.
  3. Galvan Industries, Inc.; Electrical Products Division, LLC.
  4. O-Z/Gedney; a brand of Emerson Industrial Automation.
  5. Thomas & Betts Corporation; A Member of the ABB Group.

#### 2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
  2. Stranded Conductors: ASTM B 8.
  3. Tinned Conductors: ASTM B 33.
  4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
  7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

## 2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.
- D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- F. Conduit Hubs: Mechanical type, terminal with threaded hub.
- D. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.
- E. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.
- F. Straps: Solid copper, copper lugs. Rated for 600 A.
- G. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

## 2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.

## EXECUTION

### 2.6 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.
- B. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  - 1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
  - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- C. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
  - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
  - 4. Connections to Structural Steel: Welded connectors.

### 2.7 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

### 2.8 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
  - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
  - 2. Use exothermic welds for all below-grade connections.
  - 3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
  2. Make connections with clean, bare metal at points of contact.
  3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
  5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

## 2.9 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

## SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Steel slotted support systems.
  - 2. Aluminum slotted support systems.
  - 3. Conduit and cable support devices.
  - 4. Support for conductors in vertical conduit.
  - 5. Structural steel for fabricated supports and restraints.
  - 6. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
  - 7. Fabricated metal equipment support assemblies.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
    - a. Slotted support systems, hardware, and accessories.
    - b. Clamps.
    - c. Hangers.
    - d. Sockets.
    - e. Eye nuts.
    - f. Fasteners.
    - g. Anchors.
    - h. Saddles.
    - i. Brackets.
  - 2. Include rated capacities and furnished specialties and accessories.

## PART 2 - PRODUCTS

## 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, undefined:
    - a. Allied Tube & Conduit; a part of Atkore International.
    - b. B-line, an Eaton business.
    - c. Thomas & Betts Corporation; A Member of the ABB Group.
    - d. Unistrut; Part of Atkore International.
  2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
  3. Material for Channel, Fittings, and Accessories: Galvanized steel.
  4. Channel Width: Selected for applicable load criteria.
  5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  6. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch- diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, undefined:
    - a. Cooper Industries, Inc.
    - b. Thomas & Betts Corporation; A Member of the ABB Group.
    - c. Unistrut; Part of Atkore International.
  2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
  3. Channel Material: 6063-T5 aluminum alloy.
  4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
  5. Channel Width: Selected for applicable load criteria.
  6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, undefined:
      - 1) Hilti, Inc.
      - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      - 3) MKT Fastening, LLC.
  2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, undefined:
      - 1) B-line, an Eaton business.
      - 2) Hilti, Inc.
      - 3) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      - 4) MKT Fastening, LLC.
  3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F 3125/F 3125M, Grade A325.
  6. Hanger Rods: Threaded steel.

## 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
  - 1) NECA 1.
  - 2) NECA 101
  - 3) NECA 102.

- 4) NECA 105.
  - 5) NECA 111.
- B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
  - C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
  - D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
  - E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
    1. Secure raceways and cables to these supports with two-bolt conduit clamps.
  - F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT IMC and RMC may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb .
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  1. To Wood: Fasten with lag screws or through bolts.
  2. To New Concrete: Bolt to concrete inserts.
  3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  4. To Existing Concrete: Expansion anchor fasteners.
  5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.

- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

### 3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000 psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base as follows:
  - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

END OF SECTION 260529

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## SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Metal conduits and fittings.
  - 2. Nonmetallic conduits and fittings.
  - 3. Metal wireways and auxiliary gutters.
  - 4. Boxes, enclosures, and cabinets.

#### 1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.
- C. IMC: Intermediate metal conduit.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

#### 1.5 INFORMATIONAL SUBMITTALS

### PART 2 - PRODUCTS

#### 2.1 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit; a part of Atkore International.
    - b. O-Z/Gedney; a brand of Emerson Industrial Automation.
    - c. Southwire Company.
    - d. Thomas & Betts Corporation; A Member of the ABB Group.
    - e. Wheatland Tube Company.
  2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  3. GRC: Comply with ANSI C80.1 and UL 6.
  4. IMC: Comply with ANSI C80.6 and UL 1242.
  5. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
    - a. Comply with NEMA RN 1.
    - b. Coating Thickness: 0.040 inch, minimum.
  6. EMT: Comply with ANSI C80.3 and UL 797.
  7. FMC: Comply with UL 1; zinc-coated steel.
  8. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- B. Metal Fittings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit; a part of Atkore International.
    - b. O-Z/Gedney; a brand of Emerson Industrial Automation.
    - c. Southwire Company.
    - d. Thomas & Betts Corporation; A Member of the ABB Group.
    - e. Wheatland Tube Company.
  2. Comply with NEMA FB 1 and UL 514B.
  3. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  4. Fittings, General: Listed and labeled for type of conduit, location, and use.
  5. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
  6. Fittings for EMT:
    - a. Material: Steel.
    - b. Type: Setscrew or compression.
  7. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
  8. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS AND FITTINGS

### A. Nonmetallic Conduit:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. RACO; Hubbell.
  - b. Thomas & Betts Corporation; A Member of the ABB Group.
  - c. United Fiberglass.
2. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fiberglass:
  - a. Comply with NEMA TC 14.
  - b. Comply with UL 2515 for aboveground raceways.
  - c. Comply with UL 2420 for belowground raceways.
4. ENT: Comply with NEMA TC 13 and UL 1653.
5. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
6. LFNC: Comply with UL 1660.

### B. Nonmetallic Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. RACO; Hubbell.
  - b. Thomas & Betts Corporation; A Member of the ABB Group.
  - c. United Fiberglass.
2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
  - a. Fittings for LFNC: Comply with UL 514B.
4. Solvents and Adhesives: As recommended by conduit manufacturer.

## 2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

### A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. B-line, an Eaton business.
2. Hoffman; a brand of nVent.
3. MonoSystems, Inc.

- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 Type 3R unless otherwise indicated, and sized according to NFPA 70.
  - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged type Screw-cover type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

#### 2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Crouse-Hinds, an Eaton business.
  - 2. EGS/Appleton Electric.
  - 3. Hoffman; a brand of nVent.
  - 4. Hubbell Incorporated.
  - 5. O-Z/Gedney; a brand of Emerson Industrial Automation.
  - 6. RACO; Hubbell.
  - 7. Thomas & Betts Corporation; A Member of the ABB Group.
  - 8. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- G. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- H. Gangable boxes are allowed.
- I. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.
  - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
  - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

## J. Cabinets:

1. NEMA 250, Type 1 Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## PART 3 - EXECUTION

## 3.1 RACEWAY APPLICATION

## A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC IMC.
2. Concealed Conduit, Aboveground: GRC IMC EMT RNC, Type EPC-40-PVC.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried concrete encased.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFNC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

## B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: IMC. Raceway locations include the following:
  - a. Loading dock.
  - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
  - c. Mechanical rooms.
  - d. Gymnasiums.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: IMC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

## C. Minimum Raceway Size: 1/2-inch trade size.

## D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
  3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
  4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.
- H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

### 3.2 INSTALLATION

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- D. Do not fasten conduits onto the bottom side of a metal deck roof.
- E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- F. Complete raceway installation before starting conductor installation.
- G. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

- K. Support conduit within 12 inches of enclosures to which attached.
- L. Raceways Embedded in Slabs:
  - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
  - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
  - 3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
  - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
  - 5. Change from ENT to IMC before rising above floor.
- M. Stub-Ups to Above Recessed Ceilings:
  - 1. Use EMT, IMC, or RMC for raceways.
  - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- N. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- O. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- P. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- R. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- S. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- T. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- U. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- V. Surface Raceways:
  - 1. Install surface raceway with a minimum 2-inch radius control at bend points.

2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- W. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- X. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  2. Where an underground service raceway enters a building or structure.
  3. Conduit extending from interior to exterior of building.
  4. Conduit extending into pressurized duct and equipment.
  5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
  6. Where otherwise required by NFPA 70.
- Y. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- Z. Expansion-Joint Fittings:
1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
  2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
    - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
    - d. Attics: 135 deg F temperature change.
  3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
  4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
  5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

- AA. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
  - 1. Use LFMC in damp or wet locations subject to severe physical damage.
  - 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- BB. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- CC. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- DD. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- EE. Locate boxes so that cover or plate will not span different building finishes.
- FF. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- GG. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

### 3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.4 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

### 3.5 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

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## SECTION 264313 - SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes:
  - 1. Type 2 surge protective devices.
  - 2. Enclosures.
  - 3. Conductors and cables.
- B. Related Requirements:
  - 1. Section 262416 "Panelboards" for integral SPDs installed by panelboard manufacturer.

## 1.2 DEFINITIONS

- A. Inominal: Nominal discharge current.
- B. MCOV: Maximum continuous operating voltage.
- C. Mode(s), also Modes of Protection: air of electrical connections where the VPR applies.
- D. MOV: Metal-oxide varistor; an electronic component with a significant non-ohmic current-voltage characteristic.
- E. NRTL: Nationally recognized testing laboratory.
- F. OCPD: Overcurrent protective device.
- G. SCCR: Short-circuit current rating.
- H. SPD: Surge protective device.
- I. Type 2 SPDs: Permanently connected SPDs intended for installation on the load side of the service disconnect overcurrent device, including SPDs located at the branch panel.
- J. VPR: Voltage protection rating.

## 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include electrical characteristics, specialties, and accessories for SPDs.
  - 2. NRTL certification of compliance with UL 1449.
    - a. Tested values for VPRs.
    - b. Inominal ratings.

- c. MCOV, type designations.
- d. OCPD requirements.
- e. Manufacturer's model number.
- f. System voltage.
- g. Modes of protection.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Sample Warranty: For manufacturer's special warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For SPDs to include in maintenance manuals.

#### 1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace SPDs that fail in materials or workmanship within five years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 TYPE 2 SURGE PROTECTIVE DEVICES (SPDs)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. APT, a division of Schneider Electric
  - 2. SSI, an ILSCO Company
  - 3. Siemens Energy & Automation, Inc.
  - 4. Eaton Corporation, Cutler-Hammer Products
  - 5. G.E., a division of ABB
- B. Source Limitations: Obtain devices from single source from single manufacturer.
- C. Standards:
  - 1. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1449, Type 2.
- D. Product Options:
  - 1. Include LED indicator lights for power and protection status.
  - 2. Include internal thermal protection that disconnects the SPD before damaging internal suppressor components.

3. Include NEMA ICS 5, dry Form C contacts rated at **2 A and 24 V ac** for remote monitoring of protection status.
4. Include surge counter.

E. Performance Criteria:

1. MCOV: Not less than 125 percent of nominal system voltage for 208Y/120 V and 120/240 V power systems, and not less than 115 percent of nominal system voltage for 480Y/277 V power systems.
2. Peak Surge Current Rating: Minimum single-pulse surge current withstand rating per phase must not be less than **150 kA**. Peak surge current rating must be arithmetic sum of the ratings of individual MOVs in a given mode.
3. Protection modes and UL 1449 VPR for grounded wye circuits with **208Y/120 V**, three-phase, four-wire circuits must not exceed the following:
  - a. Line to Neutral **700 V for 208Y/120 V**.
  - b. Line to Ground: **700 V for 208Y/120 V**.
  - c. Neutral to Ground: **700 V for 208Y/120 V**.
  - d. Line to Line: **1200 V for 208Y/120 V**.
4. Protection modes and UL 1449 VPR for 240/120 V, single-phase, three-wire circuits must not exceed the following:
  - a. Line to Neutral: 700 V.
  - b. Line to Ground: 700 V.
  - c. Neutral to Ground: 700 V.
  - d. Line to Line: 1200 V.
5. SCCR: Equal or exceed **100 kA**.
6. Inominal Rating: **20 kA**.

## 2.2 ENCLOSURES

- A. Indoor Enclosures: NEMA 250, Type 1.
- B. Outdoor Enclosures: NEMA 250, **Type 3R**.

## 2.3 CONDUCTORS AND CABLES

- A. Power Wiring: Same size as SPD leads, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with NECA 1.

- B. Provide OCPD and disconnect for installation of SPD in accordance with UL 1449 and manufacturer's written instructions.
- C. Install leads between disconnects and SPDs short, straight, twisted, and in accordance with manufacturer's written instructions. Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
  - 1. Do not splice and extend SPD leads unless specifically permitted by manufacturer.
  - 2. Do not exceed manufacturer's recommended lead length.
  - 3. Do not bond neutral and ground.
- D. Use crimped connectors and splices only. Wire nuts are unacceptable.

### 3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Compare equipment nameplate data for compliance with Drawings and the Specifications.
  - 2. Inspect anchorage, alignment, grounding, and clearances.
  - 3. Verify that electrical wiring installation complies with manufacturer's written installation requirements.
- B. SPDs that do not pass tests and inspections will be considered defective.
- C. Prepare test and inspection reports.

### 3.3 STARTUP SERVICE

- A. Complete startup checks in accordance with manufacturer's written instructions.
- B. Do not perform insulation-resistance tests of the distribution wiring equipment with SPDs installed. Disconnect SPDs before conducting insulation-resistance tests; reconnect them immediately after the testing is over.
- C. Energize SPDs after power system has been energized, stabilized, and tested.

### 3.4 DEMONSTRATION

- A. Train Owner's maintenance personnel to operate and maintain SPDs.

END OF SECTION 264313