

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

### **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 WORK BY OWNER:

#### 1.3 WORK SEQUENCE:

- A. During the construction period, coordinate electrical schedule and operations with Owner.

#### 1.4 SUBSTITUTIONS:

##### A. Contractor Options:

1. For products specified only by reference standards, submit any product meeting standards, by any Manufacturer.
2. For products specified by naming several products or Manufacturers, select only from products and Manufacturers named.
3. For products specified by naming one or more products, but indicating the option of selecting equivalent products by stating “or approved equivalent”, “equivalent to” or “or equivalent to” after or before specified product. Contractor must submit request, (as noted below) as required by substitutions, for any product not specifically named.
4. Contractor is not discouraged from suggesting Voluntary Alternates. However, Voluntary Alternates and substitutions will be considered if approved as noted below. Otherwise, the Contractor shall be responsible for supplying the specified product.

##### B. Substitutions:

1. Substitutions will be considered only under the following conditions:
  - a. The request is accompanied by complete data on the proposed substitution substantiating compliance with the Contract Documents including product identification and description, performance and test data, references and samples where applicable, and an itemized comparison of the proposed substitution with the products specified or named by Addenda, with data relating to Contract time schedule, design, and artistic effect where applicable, including color, texture, pattern, and design, and its relationship to separate contracts. Samples shall be submitted with the request for substitution.
2. In making request for substitution, Contractor represents:

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

- a. Contractor has personally investigated proposed product, and determined that it is equal or superior in all respects to that specified by placing his proper stamp, date, item being substituted for, referenced section of project manual and drawing sheets applicable, and signature on each submitted item.
  - b. Contractor will provide the same guarantee for substitution as for product specified.
  - c. Contractor will coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.
  - d. Contractor waives all claims for additional costs related to substitution that subsequently become apparent.
3. All requests for substitutions must receive the approval of the Engineer.
  4. The Owner and the Engineer will consider a formal request for substitution of products in place of those specified prior to the signing of the Owner/Contractor Agreement only. No substitutions will be allowed after the Contract has been signed.

### 1.5 SUBMITTALS:

- A. All submittals shall be dated and shall contain the project name, description or names of equipment; materials or equipment which are to be installed, reference to the Section of Specifications where it is specified and Drawing number where shown. Submittal packages shall contain all submittals required by that Section. All material suitable for binding shall be bound in report covers having an information window. The window shall identify the Specification Section being submitted. All submittals not submitted in this format will be returned without review.
- B. For standard manufacturer's items not requiring special shop drawings for manufacture, submit sufficient copies of manufacturer's catalog sheets to permit the Engineer to retain one copy, provide one copy for the Owner, and return adequate copies for the Contractor's use and distribution. Catalog cuts shall be of item to be furnished, showing scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams and controls, and all other pertinent information.

### 1.6 SHOP DRAWINGS:

- A. Submit legible, unfolded, copies of each drawing. Each drawing shall have a clear space for stamps. When phrase "by others" appears on Shop Drawings, the Contractor shall indicate on drawing who is to furnish material or operations so marked before submittal. When Shop Drawings are checked "resubmit", or words of like meaning, Contractor shall correct original document and submit a new copy for approval to the Engineer. After completion of checking of each submission of Shop Drawings, the Engineer will return checked copies to Contractor. For use of all trades, the Contractor shall provide such number of copies as are required for field distribution. Submit seven (7) copies of each submittal.

### 1.7 SAMPLES:

- A. Unless otherwise specifically directed by the Engineer, all Samples shall be of the precise article proposed to be furnished.

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

- B. Submit all Samples in the quantity, which are required to be returned, plus one, which will be retained by the engineer.

### 1.8 PROJECT/SITE CONDITIONS:

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare Drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Engineer before proceeding.
- C. The Drawings are diagrammatic and are not intended to include every detail of construction, materials, and equipment.
- D. The Contractor shall review the Contract Documents of all trades and shall coordinate his work with other trades as necessary to avoid conflicts and interference.
- E. Locations indicated for panels, equipment, etc., are approximate and shall be verified by instruction in the specifications and on the Drawings. Where instructions are not specific, consult the Engineer.
- F. Where substitution of other than specified equipment is made and such change requires alterations to the electrical power supply (wire, conduit, circuit breakers, starters, etc.), structural systems or any other changes, the Contractor installing substituted equipment shall include the cost for these changes.
- G. It is recognized that the contract documents are diagrammatic in showing certain physical relationships, which must be established within the mechanical/plumbing work, and in its interface with other work including utilities and electrical work, and that such establishment is the exclusive responsibility of the Contractor.
  - 1. Arrange electrical work in a neat, well-organized manner with piping and similar services running parallel with primary lines of the building construction, and with a minimum of 8 feet overhead clearance in equipment rooms.
  - 2. Locate operating and control equipment properly to provide easy access, and arrange electrical work with adequate access for operation and maintenance.
  - 3. Give right-of-way to piping which must slope for drainage.
  - 4. Advise other trades of changes required in their work for the subsequent installation of electrical work.

### 1.9 PROJECT CLOSEOUT:

- A. General: At the completion of the Project, two reviews will be performed by the Engineer to establish acceptance of the Work. The terminology of these reviews shall be:
  - 1. Preliminary Review: The preliminary review shall establish a checklist of items to be corrected and completed before the Final Review.

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

2. Final Review: The final review shall determine whether items on the checklist have been corrected and completed, and whether the work can be accepted by the Owner.

B. Closeout Submittals:

1. Coordinate with other sections of the Specifications. Submittals shall include the following:
  - a. Record Drawings: Record drawings will be provided by the electrical contractor in the form of reproducible drawing sheets and will reflect changes in electrical work. All addenda items, bulletin drawings, change order items, field changes, and items changed during project meetings shall be included on the Record Drawings and are to be recorded using a colored pen or marker, preferably red. The Record Drawings shall be the same scale and format as the Contract Documents.
  - b. Provide three (3) copies of the following:
    - 1) Operation and Maintenance Data.
    - 2) Guarantees, Warranties and Bonds.
    - 3) Certificate of Insurance for Products and Completed Operations.
    - 4) Spare Parts and Maintenance Materials.

### 1.10 ELECTRONIC FILES

- A. Electronic files of the Electrical Contract Document Drawings shall be made available from the project Engineer in AutoCad or PDF format to the Contractor for use on this project.

## **PART 2 - PRODUCTS**

### 2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
1. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
    - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

### 2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Advance Products & Systems, Inc.
  - b. Calpico, Inc.
  - c. Metraflex Co.
  - d. Pipeline Seal and Insulator, Inc.
2. Sealing Elements: NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
3. Pressure Plates: Carbon steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

### **PART 3 - EXECUTION**

#### **3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION**

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items unless indicated otherwise.
- 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 piping systems installed at a required slope.

#### **3.2 PAINTING**

- A. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

#### **3.3 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS**

- A. Electrical penetrations occur when raceways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
  - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials.

### 3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly.

### 3.5 FIELD CONDITIONS

- B. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- C. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

### 3.6 PAINT, GENERAL

- D. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- E. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

## **SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL**

2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- F. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
1. Flat Paints and Coatings: 50 g/L.
  2. Nonflat Paints and Coatings: 50 g/L.
  3. Dry-Fog Coatings: 150 g/L.
  4. Primers, Sealers, and Undercoaters: 100 g/L.
  5. Rust-Preventive Coatings: 100 g/L.
  6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
  7. Pretreatment Wash Primers: 420 g/L.
  8. Shellacs, Clear: 730 g/L.
  9. Shellacs, Pigmented: 550 g/L.
- G. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- H. Colors: As indicated on Drawings or to match existing finishes.

### 3.7PREPARATION

- I. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- J. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

END OF SECTION 26 05 00