

## **SECTION 26 0000 - ELECTRICAL**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. The existing ceilings are being removed under separate contract. The work of this contract includes:
  - 1. Install new lighting fixtures in replacement ceiling and energize from existing lighting and controls. All wiring shall be replaced back to local light switch.
  - 2. Reinstall HVAC controls on ceiling made safe from previous contract.
  - 3. Reinstall Fire Alarm and sound system devices on ceiling made safe from previous contract.
  - 4. Secure data and TV cable above the ceiling in accord with current code.
  - 5. Remove cables and alarm devices above the ceiling that are identified as abandoned by the owner.
  - 6. Installation of 4"x4" covers on open junction boxes. (include five (5) in bid).
- B. Provide a complete electrical system including but not limited to the following:
  - 1. Modifications to the existing electric panel to suit the work of this contract.
  - 2. Feeders, branch circuit and control wiring.
  - 3. Power and control wiring connections to all equipment.
  - 4. Grounding.
  - 5. Cutting, patching, etc.
  - 6. Temporary light and power.
  - 7. Connections to equipment furnished under other specifications divisions or by the Owner.
  - 8. Lighting fixtures and controls.
  - 9. Switches and outlets.
- C. The Contractor shall furnish all labor, materials, tools, transportation equipment, services and facilities required for the complete, proper, and substantial installation of all electrical work. All fixtures, devices and equipment shown, noted or required on the drawings, and/or contained herein shall be connected from the source of electric power to the final connection, tested and made ready for satisfactory operation.
- D. Any appurtenances and/or accessories not specifically mentioned, but necessary to the operation of the systems shall be provided by this Contractor at no additional cost.

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- E. The Contractor is to coordinate with other trades and Owner for equipment locations and clearances required for equipment.
- F. The Contractor hereby waives all claim to extra compensation for work performed and materials furnished beyond the scope of the Contract without written authorization by the Architect.
- G. The layout indicated on the drawings is diagrammatic. All work shall be accurately laid out on the jobsite, making adjustments as required to conform to the structural and architectural conditions and the work of other trades. Architect's approval required prior to cutting.
- H. Unless otherwise indicated, the arrangement, position, connections, etc. shown on the drawings shall be taken as practicable. The right is reserved by the Architect to make minor changes in locations and arrangements when required by job development without additional compensation to this Contractor.
- I. Cutting and patching
  - 1. Cut, channel, chase, and drill, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
  - 2. This contractor shall not do any cutting that may impair the strength of building construction. No holes are to be drilled into any structural members. Clamps or other approved holding devices are to be used.
  - 3. All cutting of existing ceilings and walls shall be performed in a manner so as to minimize damage to adjacent materials. Patching of all surfaces shall be performed in a manner approved by the architect to insure complete matching with adjacent finishes after final treatment of surfaces.
- J. Substitutions
  - 1. Any substitution to electrical items described in the contract documents will only be permitted upon written approval of the engineer. Substitution of light fixtures will require the contractor to submit samples of both the specified fixture and proposed substitution for side-by-side comparison by the engineer and architect. Samples shall be submitted at the same time as the catalog cuts or the proposed substitution shall be rejected without further review.

### **1.3 CODES, STANDARDS AND RESPONSIBILITIES**

- A. All work shall be systematically, carefully and neatly performed and shall conform to the following standards: The National Electrical Code, 2017, the requirements of Underwriters' Laboratories, inc., and O.S.H.A., International Building Code/2018, NJ ed (IBC w/ NJ edits from 3.14) and all agencies having jurisdiction.
- B. The work shall consist of furnishing all labor, materials, tools and equipment necessary to complete all electrical work as indicated on the drawings and the specifications.

- C. The contractor shall be responsible for obtaining all permits and approvals and shall pay the associated printing costs.
- D. Verify all existing conditions in the field and include in the bid price all work required to accommodate the existing installation.
- E. Intent of drawings
  - 1. Drawings are diagrammatic and indicate the general arrangement of systems and work included. Furnish all supports, fittings and accessories necessary for a complete installation.
- F. Cooperation with owner
  - 1. The contractor shall coordinate all work with the building's representative. The owner will cooperate with the contractor; however, the requirements of the owner supersede the convenience of the contractor.
- G. Examination of site
  - 1. The electrical contractor shall make a field inspection of the premises prior to submitting his bid.
- H. Submittals
  - 1. The contractor shall prepare and submit to the engineer for approval detailed shop drawings and/or catalog cuts for all equipment described herein or on the drawings. Shop drawings shall be clearly marked to demonstrate compliance with all requirements of the contract documents.
  - 2. Provide four (4) copies of the shop drawings for the following equipment:
    - a. Boxes and conduit.
    - b. Wire and Cable.
    - c. Lighting Fixtures and controls.
    - d. Wiring devices.
  - 3. Provide one (1) sample for the following equipment:
    - a. Lighting fixtures and their proposed substitutions as indicated under "Substitutions" above.

Samples may be returned to the contractor at architect's discretion.
- I. Overtime Work
  - 1. The electrical contractor will provide temporaries where required and/or schedule and perform overtime work for any work which requires a shutdown of the facilities, at no additional cost to the owner.

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J. Inspection

1. All stages of the installation will be inspected for compliance with the requirements of the contract drawings and specifications. Any portion of the construction not meeting those requirements to the satisfaction of the engineer shall be replaced at no additional cost to the owner.
2. Provide proper equipment and reasonable assistance as the engineer may require to facilitate access and inspection at the construction site.

**PART 2 - PRODUCTS**

**2.1 RACEWAYS**

- A. All conduit shall be run concealed. Conduits shall be exposed only where so indicated on the drawings or in unfinished areas. Contractor shall verify with the Architect acceptability of exposed conduit. Exposed conduit shall not be run on the floor of any space.
- B. Minimum conduit size shall be 3/4" unless approved by the engineer. The conduit system shall be completely installed prior to the installation of any conductors.
- C. Conduit shall be as follows unless otherwise indicated on the drawings.
  3. All conduit shall be electric metallic tubing with steel compression type couplings and fittings.
  4. Final connections to motors and other vibrating equipment shall be made using a minimum 18" flexible liquid tight flexible conduit.
- D. Electric Metallic Tubing (EMT): Hot dipped galvanized, mild steel tube, zinc coated, as manufactured by Triangle, Republic, Wheatland or equal.

**2.2 CONDUIT FITTINGS**

- A. Electrical Metallic Tubing: Insulated set screw fittings, EPT, Thomas and Betts, Emerson Electric or Crouse-Hinds.
- B. Flexible Metal Conduit: Insulated "Tite-Bite" fittings, Thomas and Betts, Steel City, or Crouse-Hinds.
- C. Conduit Outlet Bodies: Malleable iron fittings, Crouse-Hinds, Killark, or Crouse-Hinds.

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## 2.3 OUTLET, DEVICE, JUNCTION AND PULL BOXES:

- A. Boxes for concealed work shall be stamped galvanized steel as manufactured by Steel City, Raco, or Crouse-Hinds. Provide raised device covers to suit construction so that outlets are flush with finished surfaces. Boxes to be installed for vertical device mounting.
- B. Boxes for interior exposed work shall be made of malleable iron with threaded hubs.

## 2.4 WIRING

- A. Single conductor cables installed in conduit shall be used for feeders and to first device on branch circuits. Wire sizes #10 AWG and smaller shall be solid, #8 AWG and larger shall be stranded. All conductors shall be copper. Insulation shall be 600 volt Type THHN/THWN or XHHW rated 75 degrees C for dry or wet locations. All circuits shall have separate neutral conductors.
- B. Branch circuit wiring after the first device shall be Type MC cable employing copper conductors with Type THHN/THWN insulation. Minimum wire size shall be #12 AWG. MC cable shall contain integral insulated equipment ground conductor. All circuits shall have separate neutral conductors. MC cable shall not be used to serve motor loads.
- C. Solderless pressure type connectors shall be used throughout for splices and taps. Insulation equal to the wire insulation shall be applied at all splices and taps over the connector and adjoining wire.
- D. Control wiring, shall be individual copper conductors, #14 AWG THHN-THWN stranded installed in conduit.
- E. Wiring to recessed fixture and within fixture raceways shall match temperature rating of the fixture.
- F. Equipment Ground - Green conductor shall be used.
- G. Conductors shall be continuous from origin to panel or equipment without splices. Where tap splices are necessary and approved, they shall be made with suitable connectors in junction boxes. All terminals and tap splices shall be made secure with approved solderless pressure type connectors. Tap splices shall be wrapped with insulating plastic tape in a manner suitable for circuit voltage.
- H. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
  - 1. Phase A: Black.
  - 2. Phase B: Red.

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3. Neutral: White.
4. Ground: Green.

## **2.5 WIRING DEVICES:**

- A. Switches, receptacles and other wiring devices shall be Heavy-duty grade of type, size and rating indicated on the Contract Drawings as manufactured by Hubbell, Pass and Seymour or Leviton. All device plates shall be stainless steel, primed for painting, by same manufacture as the wiring devices.

## **2.6 SUPPORTING DEVICES**

- A. The Contractor shall furnish and install all the necessary steel for supporting lighting, fixtures, panels, starters, disconnects, etc. Kindorf, Thomas and Betts or Cooper B-Line framing systems, rods, channels, and fittings with galvanized ferrous metals will be permitted.  
Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
- B. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- (14-mm-) diameter slotted holes at a maximum of 2 inches (50 mm) o.c., in webs.
- C. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
- D. Expansion Anchors: Carbon-steel wedge or sleeve type.
- E. Toggle Bolts: All-steel springhead type.

## **2.7 IDENTIFICATION**

- A. Provide typewritten directories for panels, indicating use of each branch circuit and designating spare circuits. Handwritten directories are not acceptable. Existing schedules shall be modified to suit the work of this contract.
- B. Provide nameplates for all control equipment, special control switches, special outlets or devices, disconnect switches and starters and panelboards. Nameplates shall correspond to equipment designation as shown on drawings.
- C. Nameplates shall bear notations exactly the same as the corresponding notations that appear on any required wiring diagrams, operating instructions and/or manuals.
- D. Nameplates shall be laminated plastic with white letters on a black background fastened with stainless steel or brass screws. Adhesive or glue will not be acceptable.

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## 2.8 GROUNDING

- A. All grounding shall be in accordance with the requirements of the National Electric Code.
- B. Equipment grounding conductor shall be provided for all feeders and branch circuits which are installed in non-metallic conduits, and all motor circuits. Also, such grounding conductors shall be provided in all raceways buried in earth or using any flexible conduit. The equipment ground will consist of a metallic connection to ground all the non-current carrying metal parts of the wiring system or apparatus connected to the system, this includes all metal raceways, busways, outlet boxes, cabinets, switch boxes, motor frames and metallic enclosures for all electrical equipment.

## 2.9 INTERIOR LIGHTING

- A. Submittals: Product Data for each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features and accessories.
- B. Fixtures and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- C. Finishes: Manufacturer's standard, unless otherwise indicated.
  - 1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
  - 2. Metallic Finish: Corrosion resistant.
- D. Replace any fixtures damaged, lost or stolen during the construction of this project at no additional cost to the owner.
- E. Refer to Drawings for fixture descriptions.
- F. Set fixtures level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

END OF SECTION 26 0000

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