

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

**PART 1 - GENERAL**

**1.1 GENERAL**

- A. The Contractor shall furnish all labor, materials, tools and all other equipment required to install all the work shown and specified. It is not the intent of these drawings to show every minor detail of construction that is required. The Contractor shall furnish and install all items necessary for a complete electrical system installation and as may be required to place all equipment in proper working order. The drawings and specifications indicate the intent of the design and one to be considered as diagrammatic only. All materials shall be new and shall be UL approved where applicable. Contractor shall visit the site prior to bidding and determine the complete scope of the work to be included in his bid. All work shall be of first class workmanship and shall conform with all applicable Federal, state and local regulations and/or codes.
- B. Do not scale the drawing. Refer to actual conditions at the site for details and exact locations of equipment.
- C. Electrical system shall be completely and effectively grounded per the latest edition of the edition of the N.E.C.
- D. Equipment with damaged or scratched paint surfaces shall be touched up with factory matching paint or completely repainted.
- E. Work shall be continuous on a day-to-day basis until project is completed to minimize the disruptions.
- F. All defective work or damaged equipment shall be replaced at no additional cost.
- G. Contractor shall guarantee all materials and workmanship free from defects for a period of not less than one (1) year from date of acceptance.
  - 1. All electrical work shall be installed in a suitable manner and location required for servicing of all equipment.
  - 2. This Contractor shall make final connections to all electrically operated equipment to be installed as part of this project.

**1.2 TESTING AND ADJUSTING**

- A. At the completion of work and before final acceptance, the Contractor shall place the new installation in proper operation, adjust equipment and make necessary corrections. Faulty equipment or poor workmanship

shall be repaired or replaced. The system shall be complete, shall operate properly and shall be free of defects.

### **1.3 CONTINUITY OF SERVICES**

- A. If it becomes necessary to temporarily interrupt electrical service to any portion of the building, the Contractor shall submit a request for a temporary interruption to the Owner seven (7) days in advance of the requested interruption. All life safety system shall be maintained functional throughout the construction period.

### **1.4 DEMOLITION**

- A. Demolish, remove, dismount and disconnect electrical material and equipment which are no longer required as a result of this project.
- B. Where electrical work to remain is damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- C. Accessible Work Indicated to Be Demolished: Remove exposed electrical installation in its entirety.
- D. Abandoned Work: Cut and remove buried raceway and wiring indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap and patch surface to match existing finish.
- E. Removal: Remove demolished material from the Project site.
- F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

### **1.5 CUTTING AND PATCHING**

- A. Contractor shall do all cutting, patching and painting required to install the work. No cutting shall be done which shall affect the building structurally. All patching shall be done by workmen skilled in this type of work. All patching and painting shall match the existing finishes. Upon completion of work, clean all equipment and leave work in perfect working condition. Equipment with damaged or scratched paint surfaces shall be touched up with factory matching paint or completely repainted as determined by the Architect.

### **1.6 PAINTING**

- A. Paint supports and iron and steel work installed under this project. Paint with two coats of Rust-Oleum rust preventative paint. First coat shall be X-60 red primer and second coat shall be satin enamel in colors as selected by the Architect. At locations where it is necessary to cut and patch existing construction, painting at each location shall be performed under this Contract. New finishes shall match existing.

### **1.7 IDENTIFICATION**

- A. Each piece of electrical equipment provided as part of this project shall be identified by a micarta identification tag permanently attached to the equipment with self-threading stainless steel screws and shall indicate by name the equipment and the circuit that serves such equipment. Lettering on identification tags shall be a minimum of 1/4" in height.

### **1.8 RACEWAYS**

- A. All wiring shall be installed within conduit.
- B. Wiring within the building shall be in rigid steel or electric metallic tubing in accordance with the latest edition of the National Electrical Code requirements, except as specified otherwise. Conduit runs indicated are diagrammatic. Conduits shall be installed perpendicular and/or parallel to walls in a neat and workmanlike manner. Contractor shall furnish and install all fittings, boxes, hangers, and structural supporting members necessary to install the complete wiring system. EMT shall be assembled with compression type fittings EFCOR or approved equal. All conduits and tubing shall be securely fastened in place with galvanized malleable or stamped steel clamps, hanger rings, inserts or other approved supports. All supports shall be subject to the approval of the Architect. All conduits shall be concealed except where noted otherwise. Install flexible conduit at all motors and vibrating equipment to prevent transmission of noise and vibration. For exterior connections are liquidtight flex conduit.

### **1.9 FLEXIBLE CONDUIT**

- A. Short lengths of galvanized flexible conduit (maximum of 18" in length) shall be used at connections to motor operated equipment and short lengths of concealed flexible conduit (maximum of 6'-0" in length) may be used at final connections to recessed fixtures. Flexible conduit to equipment in wet locations shall be PVC plastic covered and the installations shall be moisture tight. Flexible conduit to equipment in equipment rooms and food preparation areas, where flexible conduits are installed at locations below 5'-0" above finished floors, shall be PVC plastic covered and the installations shall be suitable for wet locations.

### **1.10 PULL AND OUTLET BOXES**

- A. Furnish and install metal pull boxes and outlet boxes where shown and as may be required to facilitate the pulling of wires. Boxes shall be of galvanized sheet steel of such design, construction and dimensions so as

to comply with the NEC and to best adapt to the respective location, number, size, and arrangement of conduit connecting thereto, and shall be provided with suitable covers, securely fastened to box with machine screws. Boxes shall be constructed in compliance with NEMA OS 1.

#### **1.11 CONDUCTORS**

- A. Conductors shall be copper, Type THHN/THWN except where other types are required by the latest edition of the National Electrical Code. Minimum wire gauge shall be #12 AWG except where noted otherwise. Conductors installed below grade shall be copper, Type XHHW.
- B. Metal-Clad Cable (Type MC) may be installed in concealed locations for branch circuits of 30 amperes or less. Type MC cable shall be a galvanized sheathed assembly of one or more 600 volt, 90 degree C., copper conductors, each insulated and enclosed in a metallic sheath of interlocking corrugated tubes and shall comply with Article 334 and also applicable provisions of Article 300 of the National Electrical Code. Type MC cable shall be provided with an integral insulated ground conductor and shall be as manufactured by Thomas and Betts, or approved equal.
  - 1. Type MC cable shall be installed in compliance with the aforementioned Articles and shall be supported and secured at intervals not to exceed four feet. Support wires utilized for suspended ceiling or the suspended ceiling grid system shall not be utilized as the support for this cable. Type MC cable which must be installed exposed to view, in such areas as Mechanical and Electrical Equipment Rooms, shall be installed within rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
  - 2. Fittings utilized for the connection of Type MC cable to electrical boxes, cabinets, or other equipment shall be identified for use with Type MC cable and shall be of the type to provide effective bonding between the metallic sheath and such boxes, cabinets, and other equipment and shall be UL and CSA listed. Fittings shall be Thomas and Betts Catalog No. 2-050-008-B or Thomas and Betts Catalog No. 2492, or approved equal. Fittings and supports for Type MC cable shall comply with NEMA FB1 Standard Publication titled "Fittings and Supports for Conduit and Cable Assemblies" and shall be approved by the Architect prior to installation.
- C. Provide color coding for service, feeder, branch, control, and signaling circuit conductors. Color shall be green for grounding conductors and white for neutrals. Color of ungrounded conductors in different voltage systems shall be as follows:

	.208 volt, 3-phase:	277/480 volt, 3-phase
1) Phase A	black	brown
2) Phase B	red	orange
3) Phase C	blue	yellow

#### **1.12 SPLICING**

A. All splicing shall be done in outlet boxes, junction boxes, etc., and not in the conduit. Splices which occur in Wire No. 6 and larger (such as No. 4, No. 2, No. 1, etc.) shall be made with split sleeve connectors and then insulated. Pressure connectors shall be used at motor operated equipment and other vibrating equipment. In lieu of the above, splices in branch wiring No. 12 to No. 8 may be made with solderless connectors. Solderless connectors shall be in accordance with UL 486 A, B, D, the NEC and as follows:

1. Connectors: Solderless, screw-on, reusable pressure cable type, 600 volt, 105 degrees C. with integral insulation, approved for copper conductors. Solderless connectors shall be as manufactured by Ideal Industries, 3M Scotchlok or Buchanan. All connectors shall be subject to the approval of the Architect.

B. Tape Nos. 33 or 88. No. 88 weathertight tape shall be used for splices at the exterior of the building and all wet and damp locations.

#### **1.13 PANELBOARDS**

A. Panelboard shall be UL listed for service entrance applications and shall comply with NEMA PB-1 and UL 61. Panel boards shall be provided with full size phase, neutral and ground buses. Panelboard shall be suitable for standard bolt-on type circuit breakers and arranged for voltage, phases and interrupting capacities indicated. Panelboards shall be equipped with type-written circuit directories. Furnish and install UL listed lugs and connectors as required suitable for the conductors installed. Enclosure shall be NEMA Type 1.

#### **1.14 CIRCUIT BREAKERS**

A. Circuit breakers shall be standard bolt on type. Interrupting rating shall exceed available RMS Fault Current and shall be of the same manufacturer as existing panel. Multi-pole circuit breakers shall have common type elements. Ground fault type circuit breakers shall provide a minimum protection of five (5) milliamps ground fault protection and tripping.

B. New circuit breakers to be installed within existing panelboards shall be suitable for installation within the existing panelboard and shall be UL listed for installation within such panelboards. Interrupting rating

shall exceed available RMS Fault Current. Circuit breakers shall be new and shall be of the same manufacturer as existing panelboard.

#### **1.15 SAFETY SWITCHES**

- A. Safety switches shall be of the fusible or non-fusible type as indicated, quick-make, quick-break in NEMA Type 1 sheet steel enclosure. Switches shall be horsepower rated and of size and number of poles as indicated on the drawings. Safety switches shall be of type having a direct mechanical linkage between contacts and operating handle. Safety switches shall be the Westinghouse Type GF General Duty Type, General Electric, Square D, or equal as approved by the Architect. Fuses for all switches shall be of the UL Class RK1 Low Peak type as manufactured by the Bussmann Mfg. Division of Cooper Industries, or equal as approved by the Architect. Fuses for motors shall be sized to conform with the motor running current and in strict accordance with the recommendations of the fuse manufacturer. Where switches are located at the exterior of the building or in wet locations, they shall be provided with NEMA 3R weathertight enclosures.

#### **1.16 WIRING DEVICES**

- A. At each convenience outlet indicated on the drawings, furnish and install with Type 302 (18-8) stainless steel plate, a flush wall 20 ampere duplex receptacle with ground blade. Hubbell 5352, P. & S. 5352, Bryant 5352, or equal as approved by the Architect. All receptacles shall be UL listed and shall comply with Federal Specification WC-596-F.
- B. Receptacles at locations shown shall be of the ground fault interrupter type. Receptacles shall be of the terminal or feed-through type as required, rated 20 amperes at 120 volts, with special coverplate, and similar to the P. & S. Catalog No. 2091-S, or approved equal.
- C. Receptacles indicated to be installed in "WET" locations, shall be furnished and installed within a corrosion resistant heavy metal hinged cover. Provide a Hubbell Catalog Nos. 5352 and 5206 WO, Pass & Seymour Catalog Nos. 5352 and 4510, or Leviton Catalog No. 5352 and 4926. Coverplate shall be hinged and gasketed with a hinged cover for both receptacles.

#### **1.17 MAGNETIC MOTOR STARTERS - FULL VOLTAGE**

- A. Furnish and install combination full voltage magnetic starters and disconnect switches for all motors up to and including 25 horsepower with service factors of 1.15. Starters shall have three (3) current overload relays and low-voltage release. Starters shall be furnished

LOUIS A. JOHNSON VA MEDICAL CENTER  
MEDICAL GAS UPGRADE  
CLARKSBURG, WV 26301

JULY 20, 2012  
100% CONSTRUCTION DOCUMENTS  
VA PROJECT NO. VA244-P-1491  
ARRAY PROJECT NO. 3439.02

with hand-off-automatic switch, red run light, overload reset, a full set of extra interlocks with provisions for additional sets and a control transformer of ample capacity with 120 volt fused control circuit. Starter enclosure shall be NEMA 1 enclosures. Starters shall be Allen-Bradley Bulletin 512, Cutler-Hammer, Siemens-Allis, or approved equal. Disconnect switches shall be horsepower rated to match the horsepower of the motors plus 1.15 service factors connected thereto as required. Furnish and install NEMA Class RK1 fuses.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

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