

SECTION 260519 - LOW VOLTAGE ELECTRICAL POWER CONDUCTORS

PART 1 - GENERAL

- 1.1 Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division - 1 Specification sections, apply to the work of this section.
- 1.2 All conductors shall be copper of the number and AWG sizes shown on the drawings and sized to equal or exceed the requirements of the NEC. Insulation shall be rated for 600 volts. Where not shown otherwise, wiring shall be not less than No. 12 AWG
- 1.3 All conductors shall be in conformance with NEMA WC-3 (rubber-insulated wire and cable), WC-5 (thermoplastic-insulated wire and cable), and WC-7 (cross-linked-thermosetting-polyethylene-insulated wire and cable) for the transmission and distribution of electrical energy.
- 1.4 Each coil of wire shall be delivered to the job in its original unbroken wrapping bearing Underwriter's Laboratories listing.
- 1.5 All conductors shall be copper, Type THHN/THWN insulation stranded except conductors, #10 AWG or smaller, shall be solid.
- 1.6 Conductors No. 6 and smaller shall be identified by a continuous insulation color. Conductors larger than No. 6 shall be identified by three laps of colored tape equal to Scotch #35 at each point of access to the conductors. Color coding shall be as follows:

	208 Volt
Phase A Conductor	Black
Phase B Conductor	Red
Phase C Conductor	Blue
Grounded (Neutral) Conductor	White
Grounding Conductor	Green

- 1.7 Number code all control instrument wiring at all points of access, including junction boxes.
- 1.8 All wire sizes shown on the drawings are based upon the use of copper conductors with 75 degrees C rated insulation. Where appliance or equipment terminals are rated for 60 degrees C connections, conductor sizes and ampacities shall be based on 60 degrees C insulation. Where appliance or equipment terminals are rated for 60/75 degrees C connections, conductor sizes and ampacities shall be based on 60 or 75 degrees C insulation. Where appliance or equipment terminals are rated for 75 degrees C connections, conductor sizes and ampacities shall be based on 75 degrees C insulation.

PART 2 - PRODUCTS

- 2.1 Conductors shall be manufactured by American, Rome, Triangle, Southwire, Okonite or approved equal.
- 2.2 Conductors inside buildings shall have moisture and heat resistant thermoplastic insulation, type "THHN/THWN", or "XHHW", rated for 600 volts unless other types are required by the Code.
- Type "THHN" shall not be used in wet or damp locations and, where used, shall have an ampacity rating based on the temperature rating of the termination lugs, equipment, devices, etc.
- 2.3 Unless otherwise indicated, conduit sizes shown on the drawings are based upon the use of type THWN insulated conductors. Conduit sizes shall be increased where required by the NEC for the type insulation used.
- 2.4 Control wiring may be No. 14 AWG except where length of runs would not permit proper operation of the controls or where larger sizes are required by code.
- A. Class 1 remote control and signal circuit conductors shall not be smaller than No. 14 AWG.
 - B. Class 2 low energy remote control and signal circuit conductors shall not be smaller than No. 16 AWG, unless noted otherwise on the drawings or recommended by the equipment manufacturer incorporating such wiring.
 - C. Conductor insulations shall be as specified herein before except that No. 16 AWG conductors for remote control or signal circuits may be commercial grade fixture wire, Type RF-2, TF or other types recognized by the NEC as applicable for the purpose.
- 2.5 The use of type NM, NMC and MC cable is prohibited.
- 2.6 Instrumentation cables shall be low signal level type, 16 AWG, stranded copper with insulation of chemically cross-linked polyethylene or flame retardant ethylene propylene, 90 degrees C, 600 volts. Conductors shall be arranged as twisted pair, 1-1/2 inch minimum lay. Shielding shall be 100 percent coverage aluminum polyester tape with 18 gage bare, tinned, copper drain wire in continuous contact with tape. Jacket shall be polyvinyl chloride or chlorinated polyethylene, suitable for installation in cable tray.
- 2.7 Connections to motor “pig-tails” shall be by copper split-bolt type connectors “wrapped” with one layer of varnish tape, then one layer of rubber tape then one layer of electrical tape.
- 2.8 Terminal strips shall be Barrier type, rated 600 volts.

PART 3 - EXECUTION

- 3.1 Provide all wire and cable of AWG sizes indicated on the drawings and as specified or required to provide a complete installation.
- 3.2 Unless otherwise noted, splices in No. 8 and smaller conductors shall be made with screw type connectors listed by UL as 600 volt pressure cable connectors for branch circuit and fixture splicing applications and shall be equal to IDEAL "WING NUTS", SCOTCHLOK Spring Connectors, 3M wire nuts or approved equal connectors. Splices in copper conductors larger than No. 8 shall be made with Thomas and Betts, 3M, Burndy, or approved equal solderless connectors with molded composition covers.
- 3.3 Wiring must be installed in conduit and the minimum size conduit is ¾". Install splice-free conductors within ducts, conduits or earth.
- 3.4 Conductors shall be continuous from outlet to outlet with splices made only in outlet or junction boxes.
- 3.5 Insulate splicing connectors to at least 200 percent of insulation. Use pre-stretched tubing connector insulators, 3M PST, for No. 2 and larger conductors. Pull conductors using recognized methods and equipment leaving eight inches (minimum) of wire at junctions for connections.
- 3.6 Use UL listed compound as required to facilitate pulling. Complete connections and clean out conduit system before pulling wire.
- 3.7 Form and tie all wiring in panelboards utilizing Velcro style wire ties that will allow ease of access to conductors by the Owner's maintenance staff.
- 3.8 Wiring in hot locations and for recessed fixtures shall have heat-resistant insulations applicable for the purpose.
- 3.9 Where the conductor length from the panel to the first outlet on a 277 volt circuit exceeds 125 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG. Where the conductor length from the panel to the first outlet on a 120 volt circuit exceeds 50 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG.

END OF SECTION 260519

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