

## SECTION 16120

### WIRE AND CABLE - 600 VOLTS AND UNDER

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. Furnish and install electrical wires and cables for the distribution of electric power, controls, grounding and signals for the electrical systems.

##### 1.02 REFERENCE DOCUMENTS:

- A. The Special Provisions for Electrical Work are hereby made a part of this section of the work. Refer to Section 16010.

##### 1.03 SUBMITTALS:

- A. Submit complete manufacturers' specification data on each type of conductor to be supplied to the job.
- B. Include proposed colors, color markings and other identification as a part of the submittal.

##### 1.04 QUALITY ASSURANCE:

- A. Electrical conductors shall be UL listed and bear the UL label.

#### PART 2 - PRODUCTS

##### 2.01 CONDUCTORS:

- A. Wires and cables shall have conductors of soft-drawn annealed copper having a conductivity of not less than 98% of that of pure copper. Wire and cable shall be equal to that manufactured by Anaconda.
- B. As a minimum standard, all conductors shall comply with 1996 National Electrical Code.
- C. Where not specifically indicated otherwise, wire and cable insulation type shall be as follows:
  - 1. For general use - Type THHN or THWN, 600 volt.
  - 2. For branch circuits of No. 12 and No. 10 AWG - Type THHN, 600 volt.
  - 3. For control wiring - Type THHM 600 volts, No. 14 AWG minimum size.

4. Wiring run underground - Type THHN/THWN, or XHHW 600 Volt.
  5. For fixture wiring - Type AF, 300 volts, No. 12 AWG minimum size.
  6. For branch circuit wiring run in fluorescent fixture channels - Type THHN, 600 volts, No. 12 AWG minimum size.
  7. See other sections of work for alarm communications and other low-energy systems wiring.
  8. All communication , and low voltage control wire run in plenum above ceilings and not protected by conduit shall be Teflon coated plenum cable as required by code.
  9. Service and/or feeder wiring to panelboards may be XHHW at the Contractors option.
- D. Wire shall be solid for No. 10 and smaller and stranded for No. 8 AWG and larger.
- E. All wire and cable shall be factory-color coded. Colors for each phase and neutral shall be used consistently throughout each system. The following color codes shall be used and maintained throughout the system:

208/120 V SYSTEMS

480/277V SYSTEMS

Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green w/ Tracer
Switch Legs	Purple	

On wires No. 6 and larger and where factory color is not available, wires and cables shall be color-coded by a one inch (1") wide band of colored Scotch tape on ends of each conductor, or by coating a 3" band at the end of the cable and in each pull box with brilliant waterproof lacquer.

## 2.02 TERMINATIONS, SPLICES AND TAPS

- A. Cable terminations, splices and taps for copper conductors shall be:
1. For terminations - O. Z. Manufacturing Company or equal, Type XLH.
  2. Splices and Taps - O. Z. Manufacturing Company or equal, clamp-type solderless connectors except splices and taps for No. 8 AWG and smaller conductors may be Scotchlock Spring Connectors, Buchanan "B" cap, Ideal Wing Nuts or T & B "Piggy" connectors.

## 2.03 SUPPORTS:

- A. Supports for wiring in cabinets, panels, pull boxes, wireway and junction boxes shall be T & B Ty-Rap cable clamps and cable ties.
- B. Supports in vertical feeders shall be two-piece conduit type equal to O. Z. Company Style "S".

## **PART 3 - INSTALLATION**

### **3.01 CONDUCTOR SELECTION:**

- A. The minimum size of wire shall be No. 12 AWG except as noted otherwise on the Drawings or specified herein. All branch circuit home runs over 70 feet from panel, measured along the length of the raceway, shall be wired with No. 10 AWG minimum.
- B. The Drawings generally indicated the number of wires in a conduit. Provide the proper number of wires in each conduit to complete the entire electrical system.

### **3.02 INSTALLATION:**

- A. Route each conductor through an approved Electrical Raceway. Pull conductors into conduit only after all conduits and outlet boxes are permanently in place. Pull wires or strings shall be inserted only after the raceway installation is complete.
- B. Run feeders and mains continuously without splice from line to load terminals and identify phases each pull box and in the gutters of each switchboard and panelboard in which they connect. Splices in feeders may be made only where designated on the Drawings or where specific prior approval is given.
- C. Neatly train, control and circuit wiring in cabinets, panels, pull boxes, wireways, and junction boxes and tie with T & B Ty-Rap nylon cable ties. Clamp or fasten control or circuit cabling in cabinets or other equipment with non-metallic nylon T & T Ty-Rap cable clamps and mounting brackets.
- D. Install cable supports per N.E.C. in all vertical feeders and in boxes provided for the feeders where not terminated in electrical panels or equipment within code distances. Supports shall be of the two-piece conduit type, which clamp each individual conductor firmly and tightens due to weight of cable.

### **3.03 TERMINATIONS, SPLICES AND TAPS:**

- A. Connections of conductors to terminals shall be made by pressure connections. Solder joints will be permitted only for low voltage controls. Joints and splices shall be made with clamp type solderless connectors and insulated with rubber and friction tape or Scotch No. 33 plastic tape. Spring connectors may be used for splicing No. 8 AWG or smaller conductors.

### **3.04 SUPPORTS:**

- A. Install supports to hold conductors in place in each panelboard, cabinet, pull box, junction box and wire-way.
- B. Install cable supports in vertical runs of conductors in cabinets and pull boxes.

**END OF SECTION**