



## **SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

### **PART 1 – GENERAL**

#### **1.1 SUMMARY**

- A. Section includes 600V building wire and cable; and wiring connectors and connections.

#### **1.2 SYSTEM DESCRIPTION**

- A. Product Requirements: Provide products as follows:
1. Solid conductor for feeders and branch circuits 12 AWG and smaller.
  2. Stranded conductors for control circuits.
  3. Conductor not smaller than 12 AWG for power and lighting circuits.
  4. Conductor not smaller than 14 AWG for control circuits.
  5. Increase wire size in branch circuits to limit voltage drop to the maximum allowed by California (CA) Title 24 Coordinate with upstream feeder voltage drop.
- B. Wiring Methods: Provide the following wiring methods:
1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN insulation, in raceway.
  2. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN insulation, in raceway.
  3. Above Accessible Ceilings: Use only building wire, Type THHN/THWN insulation, in raceway.
  4. Wet or Damp Interior Locations: Use only building wire, Type THHN/THWN insulation, in raceway.
  5. Exterior Locations: Use only building wire, Type THHN/THWN insulation, in raceway.
  6. Underground Locations: Use only building wire, Type THHN/THWN insulation, in raceway.
  7. Other Locations: Use only building wire, Type THHN/THWN insulation, in raceway.

#### **1.3 QUALITY ASSURANCE**

- A. Provide wiring materials located in plenums with: peak optical density not greater than 0.5; average optical density not greater than 0.15; and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.



## **PART 2 - PRODUCTS**

### **2.1 BUILDING WIRE**

- A. Manufacturers:
  - 1. **General Cable Co.**
  - 2. **Southwire Co.**
  - 3. **The Okonite Company.**
- B. Product Description: Single conductor insulated wire.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 75 degrees C.
- F. Insulation Material: Thermoplastic.

### **2.2 TERMINATIONS**

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.
- B. Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Completely and thoroughly swab raceway before installing wire.

### **3.2 INSTALLATION**

- A. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- B. Identify and color code wire and cable. Identify each conductor with its circuit number or other designation indicated.
- C. Special Techniques--Building Wire in Raceway:
  - 1. Pull conductors into raceway at same time.
  - 2. Install building wire 4 AWG and larger with pulling equipment.
- D. Special Techniques - Wiring Connections:
  - 1. Clean conductor surfaces before installing lugs and connectors.



2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
  3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
  4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
  5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
  6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- E. Install solid conductors for branch circuits 12 AWG and smaller. Do not place bare stranded conductors directly under screws.
- F. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.
- G. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.
- H. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

### **3.3 WIRE COLOR**

- A. General: All power and branch circuit conductors shall be provided with color-coded insulation or color-coded self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide. Vinyl tape shall be used in vaults, pull and junction boxes, manholes and handholes. Identify the source and circuit number of each set of conductors with write-on tags.
- B. Colors: Color coding shall be as follows:

<u>Phase</u>	<u>208Y/120V</u>	<u>480Y/277V</u>
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	White with Black Stripe
Ground	Green	Green

END OF SECTION 26 05 19