

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Building wire and cable.
- B. Metal clad cable.
- C. Non-metallic sheathed cable.
- D. Wiring connectors and connections.

1.2 RELATED SECTIONS

- A. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- B. Section 26 05 53 - Identification.

1.3 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.4 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.5 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.
- C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

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1.6 COORDINATION

- A. Determine required separation between cable and other work.
- B. Determine cable routing to avoid interference with other work.

PART 2 - PRODUCTS

2.1 BUILDING WIRE AND CABLE

- A. The following specification for building wire and cable is based on the use of copper conductors. The substitution for aluminum conductors shall be permitted for conductor sizes #2 AWG and larger provided an ampacity rating equal to that of copper conductors is maintained.
- B. Manufacturers:
 - 1. *Southwire.*
 - 2. *General Cable.*
 - 3. *Rome.*
 - 4. Substitutions: Or Approved equal.
- C. Description: Single Conductor insulated wire.
- D. Conductor: Copper.
- E. Insulation Voltage Rating: 600 volts.
- F. Insulation Type: THHN or XHHW.
- G. Insulation Color: Color of all service, feeder, branch, motor control, and signaling circuit conductors shall be green for grounding conductors, and white for neutrals. The color of the ungrounded conductors in different voltage systems shall be as follows:
 - 1. 120/208 volt, 3-phase:
 - Phase A - black
 - Phase B – red
 - Phase C - blue

2.2 METAL CLAD CABLE

- A. Manufacturers:
 - 1. *General Cable.*
 - 2. *Phelps Dodge Cable.*
 - 3. *Triangle.*
 - 4. Substitutions: Or Approved equal.
- B. Description: ANSI/NFPA 70, Type MC.
- C. Conductor: Copper only.

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- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 60 degrees C.
- F. Insulation Material: Thermoplastic.
- G. Armor material: Steel or aluminum.
- H. Armor Design: Interlocked metal tape.
- I. Jacket: None.

2.3 NONMETALLIC-SHEATHED CABLE

- A. Manufacturers:
 - 1. *Rome Cable*
 - 2. *General Cable*
 - 3. *Triangle*
 - 4. *Southwire*
 - 5. Substitutions: Or Approved Equal.
- B. Description: ANSI/NFPA 70, Type NMC.
- C. Conductor: Copper only.
- D. Insulation Voltage rating: 600 volts.

2.4 WIRING CONNECTORS

- A. Manufacturers:
 - 1. *3M.*
 - 2. *Ideal.*
 - 3. *Thomas and Betts.*
 - 4. Substitutions: Approved equal.
- B. Description: Compression set or twist-on type with integral molded insulation and internal metallic compression ring or spiral screw-on connecting device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire and cable has been completed.

3.2 PREPARATION

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

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3.3 WIRING METHODS

- A. Concealed Interior Locations (wood studs): Non-metallic sheathed cable or Type MC cable.
- B. Concealed Interior Locations (metal studs): Type MC cable, or non-metallic sheathed cable with grommets provided in cable openings in studs.
- C. Exposed Interior Locations (with prior approval by Architect): Building wire in surface metal raceway.
- D. Exposed Exterior Locations (with prior approval by Architect): Building wire in conduit.
- E. Service Entrance: Building wire in conduit.
- F. Panelboard Feeders: Type MC cable.
- G. Loadcenter Feeders: Type MC cable, or Type SE cable.
- H. Exterior Locations: Building wire in conduit.

3.4 INSTALLATIONS

- A. Install products in accordance with manufacturers' instructions.
- B. Use solid conductor for feeders and branch circuits 10 AWG and smaller.
- C. Use stranded conductors for control circuits.
- D. Use conductor not smaller than 12 AWG for interior power and lighting circuits. Use Conductor not smaller than 10 AWG for exterior lighting circuits.
- E. Use conductor not smaller than 16 AWG for control circuits.
- F. Use 10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.
- G. Pull all conductors into raceway at same time.
- H. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- I. Protect exposed cable from damage.
- J. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure. Do not rest cable on ceiling panels.
- K. Use suitable cable fittings and connectors.
- L. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- M. Clean connector surfaces before installing lugs and connectors.

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- N. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- O. Use split bolt connectors for conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- P. Use solderless pressure connectors with insulating covers for conductor splices and taps, 8 AWG and smaller.
- Q. Use insulated spring wire connectors with plastic caps for conductor splices and taps, 10 AWG and smaller.
- R. Where cable is to be installed attached to metal roof deck, maintain a 1-1/2" clearance between the cable and the roof deck.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Identify wire and cable under provision of Section 26 05 53.

3.6 FIELD QUALITY CONTROL

- A. Inspect wire and cable for physical damage and proper connection.
- B. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- C. Verify continuity of each branch circuit conductor.

END OF SECTION