

SECTION 26 05 10: CONDUCTORS & CABLE

1. GENERAL

- A. This section details general requirements for low voltage power and control wire, cable and accessories, rated up to 600 Volts AC
- B. All power, control and building wire shall be copper (no aluminum or aluminum alloy wire)
- C. Use stranded conductors for power circuits over # 8? AWG; solid is allowed for smaller conductor sizes and for control circuits
- D. Minimum conductor size is 12 AWG for power and lighting circuits
- E. Minimum conductor size is 16 AWG for Class 2 and 3 control circuits
- F. Sharing of neutral wires for multiple single-phase circuits is prohibited. MC Cable to be color coded based on system use, as follows:
 - 1. MC cable used for Building Automation System (BAS) control wiring: Blue
 - 2. MC cable used for fire alarm wiring: red
- G. Identify wire and cable with its circuit number or other designation indicated
- H. Cables shall be directly supported to building structure and independent of other piping, mechanical equipment or ceiling supports; cable supports shall be devices such as "caddy clips" and "bridle ring" supports and "J hooks", listed for the intended use
- I. Nylon tie wraps are not acceptable for cable supports; they are acceptable for cable training and bundling
- J. For existing work:
 - 1. Disconnect abandoned circuits and remove circuit wire and cable; remove abandoned boxes when wire and cable servicing boxes is abandoned and removed; install blank covers for abandoned boxes not removed
 - 2. Maintain access to existing wiring connections remaining active and requiring access

2. CABLE APPLICATIONS

- A. Following is a summary of where various common types of cable installation methods are allowed. All other wiring installations shall be run in conduit
 - 1. Type NMR (Romex) cable: 1-3 family residential facilities, run concealed for branch circuit power, lighting, fire and carbon monoxide circuit wiring only
 - 2. Type AC cable (jacket used as ground): Not allowed
- B. Type MC cable (with full-rated ground conductor): standard (steel) jacket and "MC-Light" aluminum jacket acceptable
 - 1. Cable allowed after the first pull-point from the local branch circuit distribution panel; final connections to distribution panel to be run in conduit.
 - 2. All facilities, dry interior, non-classified locations only, where run concealed within accessible walls and above accessible (hung) ceilings. Accessible walls are walls that have an accessible (hung ceiling) on at least one adjacent side.

- i. Electrical branch circuits, equipment feeders rated less than 30 amps and control circuits (equipment and distribution panel feeders rated over 30 amps to be run in conduit).
 - ii. Fire alarm circuits, notification and detection circuits and controlled device circuits (home run circuits from floor to floor and from main panel to subpanels to be run in conduit)
- C. Residential facilities with hard (plaster) ceilings, dry interior locations:
 - 1. Electrical branch circuits, equipment feeders rated less than 30 amps and control circuits (equipment and distribution panel feeders rated over 30 amps to be run in conduit)
 - 2. Fire alarm: notification and detection circuits and controlled device circuits (home run circuits from floor to floor to be run in conduit)
 - 3. Carbon monoxide detector circuits and smoke detector circuits
- D. Power-limited control wiring (BAS controls, telecommunications wiring, audiovisual control wiring, etc.): all facilities, dry interior locations only, run concealed within accessible walls and above accessible (hung) ceilings; accessible walls are walls that have an accessible (hung ceiling) on at least one adjacent side
- E. Cabling run exposed within return air plenum spaces shall be rated for the application (low smoke jacketed cable)
- F. Type SO and SJO Cables (with full-rated ground conductor): all facilities, dry interior locations only. Use for portable equipment rated less than 30 amps; larger loads shall be hard-wired

3. TERMINATIONS

- A. Splices and taps under 600 volts:
 - 1. 10 AWG and smaller: copper compression type or twist-on metal spring-type connectors with color-coded insulating nylon covering. Connectors for exterior and direct burial use shall be listed for the application.
 - 2. 8 AWG and larger: hydraulic compression connectors, mechanical bolted pressure type, such as ILSCO Clear tap, or listed insulated terminal blocks.
- B. Cable lugs and Terminations under 600 volts:
 - 1. 10 AWG and smaller: copper compression type with color-coded insulating nylon covering
 - 2. 8 AWG and larger: hydraulic compression connectors, pre-filled with anti-oxidant compound
 - 3. Lug connections to bus bars: provide with tin-plated lugs and "Belleville" style washers
 - 4. Tape all terminations to match cable insulation rating
- C. "Push-on" type terminators and splice taps are not acceptable

4. WIRE COLOR

- A. For wire sizes 6 AWG and smaller, install wire colors in accordance with the following:
 - 1. Black and red for single phase circuits at 120/240 volts
 - 2. Black, blue, and red for circuits at 120/208 volts single or three phase
 - 3. Brown, orange, and yellow for circuits at 277/480 volts single or three phase
- B. For wire sizes 4AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
 - 1. Black and red for single phase circuits at 120/240 volts
 - 2. Black, blue, and red for circuits at 120/208 volts single or three phase
 - 3. Brown, orange, and yellow for circuits at 277/480 volts single or three phase
- C. Neutral Conductors:
 - 1. White for 120/240 and 120/208 volt circuits, and gray with a yellow tracer for 277/480 volt circuits
 - 2. When two or more neutrals are located in one conduit, individually identify each with proper circuit number
 - 3. When a common neutral is used a 200% rated neutral shall be provided