

SECTION 26 05 19
600V WIRE AND CABLE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide 600V wire and cable in accordance with the Contract Documents.
- B. Related work specified in other divisions of these specifications.
 - 1. Raceways and Boxes

1.2 REFERENCE STANDARDS

- A. Published specifications standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this Section where cited below:
 - 1. ICEA – Insulated Cable Engineers Association, Inc.
 - a. ICEA S-19-81 Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
 - b. ICEA S-61-402 Thermoplastic Insulated Wire & Cable for the Transmission & Distribution
 - c. ICEA S-66-524 Cross-Linked Polyethylene Insulated Wire & Cable for Transmission & Distribution
 - 2. NEMA – National Electrical Manufacturers Association
 - a. NEMA WC 3 Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
 - b. NEMA WC 7 Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
 - 3. UL – Underwriters Laboratories Inc.
 - a. UL 44 Thermoset-Insulated Wires and Cables
 - b. UL 83 Thermoplastic-Insulated Wires and Cables
 - c. UL 854 Standard for Service-Entrance Cables
 - d. UL 1059 Standard for Terminal Blocks
 - 4. ASTM – American Society for Testing and Materials
 - a. ASTM B3 Standard Specification for Soft or Annealed Copper Wire

1.3 QUALITY ASSURANCE

- A. Wire and cable shall be of the same manufacturer.

1.4 SUBMITTALS

- A. Field test reports.

1.5 FIELD TESTING

- A. Inspect splices and terminations and make mechanically and electrically tight during the 15-day period immediately prior to final acceptance of the work.
- B. Feeder insulation shall be tested after installation, and before final connection.
 - 1. Tests shall be performed with a 500 volt megger, and conductors shall test free from short circuits and grounds.
 - 2. Conductors shall be tested phase-to-phase and phase-to-ground.
 - 3. Furnish the instruments, materials, and labor required.
- C. Demonstration: Subsequent to wire and cable installation and connection, energize circuits and demonstrate functioning in accordance with contract requirements. Correct deficiencies and retest

to demonstrate compliance.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Wire and Cable:
 - 1. Southwire, Encore, AFC, General Cable, Priority Wire and Cable, BICC, Essex, Cerro, United
- B. Connectors:
 - 1. Wire size number 14 through number 6:
 - a. Hand applied: Piggy (Thomas & Betts), Scotchlock (3M), or Wing Nut (Ideal).
 - b. Tool applied: Burndy HYDENT, or Thomas & Betts Stakon.
 - 2. Wire size number 4 through number 1:
 - a. Tool applied: One-hole compression type, Burndy HYLUG, or Thomas & Betts 54000 Series.
 - 3. Wire size number 1/0 through 1000 MCM:
 - a. Tool applied: Two-hole compression type, Burndy HYLUG, or Thomas & Betts 54000 series.
 - 4. Aluminum conductors:
 - a. Tool applied: Compression type, Burndy HYPLUG.
- C. Electrical Tape:
 - 1. Insulating type, Johns-Manville or 3M.

2.2 WIRE AND CABLE

- A. General:
 - 1. 600V minimum insulating rating.
- B. Conductor:
 - 1. Electrical grade, annealed copper, tinned if rubber insulated, and fabricated in accordance with ASTM and ICEA standards. Minimum size number 12 for branch circuits; number 14 for control wiring.
 - 2. Aluminum conductors are permitted for feeders between switchboards, distribution panels, panelboards, motor control centers, dry type transformers and busway plug-in units. Aluminum conductors are not permitted for feeders with a circuit rating lower than 90A. Aluminum conductors are not permitted for branch circuits or equipment connections.
- C. Stranding and Number of Conductors:
 - 1. Number 12 and number 10 solid.
 - 2. Larger than number 10, stranded ASTM Class B.
 - 3. Control wires stranded in accordance with ASTM Class B stranding designations.
 - 4. Cables for low-voltage systems shall be multi-conductor type unless otherwise noted.
- D. Insulation:
 - 1. Indoor Applications: 600 volts, PVC insulation, nylon jacket, surface-printed identification, listed as type THHN or THWN per UL 83. Metal Clad cables to be used for unit feeders.
 - 2. Exterior and Underground Applications: 600 volts, XLPE insulation, surface-printed identification, listed as XHHW-2 per UL.
- E. Color Coding:
 - 1. Wiring shall be color coded as follows:

Conductor	120/208V System	277/480V System
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow

Conductor	120/208V System	277/480V System
Neutral	White	Grey
Ground	Green	Green
Isolated Ground	Green/Yellow Stripe	Green/Yellow Stripe

2. Wire number 8 and smaller shall be factory-color coded the entire length. Wire number 6 and larger shall be color coded by color taping entire length of exposed conductor at all accessible locations or factory-color coded where available.
3. Control wiring shall be color coded in accordance with manufacturer's recommendations.

PART 3 - EXECUTION

3.1 GENERAL

- A. Maximum of four current carrying conductors (including neutral) in one conduit unless otherwise indicated. Contractors shall derate conductors and size feeders and conduits in compliance with code.
- B. Provide minimum number 10 wiring for 120-volt branch circuits exceeding 150 feet in length from panelboard to furthest outlet. Provide minimum number 10 wiring for 277-volt branch circuits exceeding 250 feet in length from panelboard to furthest outlet.
- C. Do not install wire until raceway systems are complete.
- D. Provide cable supports for vertical risers.
- E. Wire size shall be uniform for the entire length of the circuit unless noted otherwise.
- F. Do not splice feeders or dedicated branch circuits unless otherwise indicated.
- G. Make connections, splices, taps, and joints with solderless devices, mechanically and electrically secure. Coat connections with oxide inhibitor and torque to manufacturer's specifications.
- H. Lubricate cables to facilitate pulling. Lubrication material shall be inert to cable insulation and raceways.
- I. Install compression connectors with hydraulic die, embossing die code into connector. Connect to bus with Bellville type washers for positive pressure over complete contact area. Insulate with heat-shrink tubing.
- J. Provide a separate neutral for dimmed branch circuits, ground fault interrupter branch circuits, and branch circuits serving isolated ground and isolated ground surge suppressor type receptacles.
- K. Conductors in underfloor electrical systems shall be number 10 AWG minimum.
- L. Where required to comply with 2-hour rating, provide assemblies for life safety and smoke control equipment that use State Fire Marshal-approved components to maintain fire rating and survivability.

END OF SECTION 26 05 19

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