

SECTION 16120 - WIRES AND CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this Section.
- B. This Section is a Division 16 Basic Electrical Materials and Methods section, and is part of each Division 16 section making reference to electrical raceways specified herein.

1.02 DESCRIPTION OF WORK:

- A. Extent of electrical wire and cable work is indicated by drawings and schedules.
- B. Types of electrical wire, cable, and connectors specified in this Section include the following:
 - 1. Copper conductors.
 - 2. Fixture wires.
 - 3. Split-bolt connectors.
- C. Applications of electrical wire, cable, and connectors required for project are as follows:
 - 1. For power distribution circuits.
 - 2. For lighting circuits.
 - 3. For appliance and equipment circuits.
 - 4. For motor-branch circuits.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of electrical wire and cable products of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC requirements as applicable to construction, installation and color coding of electrical wires and cables.
- C. IEEE Compliance: Comply with applicable requirements of IEEE Stds. 82, "Test Procedures for Impulse Voltage Tests on Insulated Conductors", and Std. 241, "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to wiring systems.
- D. ASTM Compliance: Comply with applicable requirements of ASTM B1, 2, 3, 8 and D-753. Provide copper conductors with conductivity of not less than 98% at 20°C (68°F).
- E. The following systems of color coding shall be strictly adhered to:
 - 1. grounded leads, green;
 - 2. grounded neutral leads, white;
 - 3. 120/208 volt, ungrounded phase wires, black, red and blue;
- F. The color code assigned to each phase wire shall be consistently followed throughout.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver wire and cable properly packaged in factory-fabricated type containers, or wound on NEMA specified type wire and cable reels.
- B. Store wire and cable in clean dry space in original containers. Protect products from weather, damaging fumes, construction debris and traffic.
- C. Handle wire and cable carefully to avoid abrading, puncturing and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wires/cables is maintained.

PART 2 - PRODUCTS

2.01 Building Wires: Provide factory-fabricated wires of sizes, ampacity ratings, and materials for applications and services indicated.

- A. Conductor insulation shall be dual type THHN/THWN 75 C (167 F) for dry, damp, and wet locations. Conductor insulation with single type marking THHN 90 C (194 F) may be used for dry locations only.
- B. All branch circuit conductors larger than #10 AWG shall be stranded.

PART 3 - EXECUTION

3.01 INSTALLATION OF WIRES AND CABLES:

- A. General: Install electrical cables, wires and wiring connectors as indicated, in compliance with applicable requirements of NEC, NEMA, UL, and NECA's "Standard of Installation" and in accordance with recognized industry practices.
- B. Unless otherwise noted, all branch circuit conductors shall be No. 12 AWG.
- C. Install No. 10 AWG wire in lieu of No. 12 wire for any branch circuit in excess of 100' (3048 CM) linear length.
- D. Leave a minimum of 8" (200 MM) slack wire in every outlet box whether it be in use or left as spare for future.
- E. Install pull boxes in circuits or feeders over 100' (3048 CM) long.
- F. Make all splices and connections only at outlet, pull or junction boxes.
- G. Install UL Type THW, THWN or THHN wiring in conduit, for feeders and branch circuits.
- H. Pull conductors simultaneously where more than one is being installed in same raceway.
- I. Use pulling compound or lubricant, where necessary; compound used must not deteriorate conductor or insulation.
- J. Use pulling means including, fish tape, cable, rope and basket weave wire/cable grips which will not damage cables or raceway.
- K. Keep conductor splices to minimum.

- L. Install splices and tapes which possess equivalent-or-better mechanical strength and insulation ratings than conductors being spliced. Use splice and tap connectors which are compatible with conductor material.

3.02 FIELD QUALITY CONTROL:

- A. Prior to energization of circuitry, check installed feeder wires and cables with megohm meter to determine insulation resistance levels to ensure requirements are fulfilled. A list of feeders tested shall be submitted to the engineer indicating the insulation resistance level for each cable.
- B. Prior to energization, test wires and cables for electrical continuity and for short-circuits.
- C. Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

END OF SECTION 16120