

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following electrical materials and methods:
 1. Building wire, connectors, and splices for branch circuits and feeders.
 2. Electrical identification.
 3. Electrical demolition.
 4. Cutting and patching for electrical construction.
 5. Meter sockets.

1.03 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
 1. Submit cut sheets for all metering equipment.
- B. Product Data for each type of product specified.
- C. Coordination Drawings for electrical installation.

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 70 for components and installation.
- B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 1. The Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.
 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

1.05 SEQUENCE AND SCHEDULING

- A. Coordinate electrical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.
- C. Coordinate connecting electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- D. Coordinate installing electrical identifying devices and markings prior to installing acoustical ceilings and similar finishes that conceal such items.

PART 2 PRODUCTS

2.01 BUILDING WIRE

- A. Description: Single conductor, copper. Solid conductor for No. 10 AWG and smaller; stranded conductor for larger than No. 10 AWG.
- B. Thermoplastic Insulated Wire: Conform to NEMA WC 5.
- C. Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for

service indicated. Select to comply with Project's installation requirements.

- D. NM cable shall be use for branch circuits in stud walls.
- E. Four wire telephone cable shall be furnished and installed to locations indicated. Face plates with connector shall be included.
- F. Co-ax television cable shall be furnished and instlled to location indicated. Face plates and connectors shall be provided.

2.02 ELECTRICAL IDENTIFICATION

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
- B. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape not less than 3 mils thick by 1 inch wide (0.08 mm thick by 25 mm wide).
- C. Underground Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 - 1. Size: Not less than 4 mils thick by 6 inches wide (0.102 mm thick by 152 mm wide).
 - a. Compounded for permanent direct-burial service.
 - b. Printed Legend: Indicates type of underground line.
- D. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- E. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

2.03 METER SOCKETS

- A. Meter sockets comply with serving utility company requirements.
- B. Identify each meter base by unit number with stenciled numbers 2" height with black enamel paint . Two coats of paint are required. The paint shall be rated for outdoor use and appropriate for metal.

PART 3 EXECUTION

3.01 EQUIPMENT INSTALLATION REQUIREMENTS

- A. Install components and equipment to provide the maximum possible headroom where mounting heights or other location criteria are not indicated.
- B. Install items level, plumb, and parallel and perpendicular to other building systems and components, except where otherwise indicated.
- C. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Give right of way to raceways and piping systems installed at a required slope.

3.02 WIRING METHODS

- A. Feeders: Type THHN/THWN, copper conductor, in raceway, except as otherwise indicated.
- B. Branch Circuits: Type THHN/THWN, in raceway.

3.03 ELECTRICAL SUPPORTING METHODS

- A. Damp Locations and Outdoors: Hot-dip galvanized materials components.
- B. Dry Locations: Steel materials.

3.04 INSTALLATION

- A. Install wires in raceway according to manufacturer's written instructions and NECA's "Standard of Installation."
- B. Conductor Splices: Keep to the minimum and comply with the following:
 - 1. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 2. Use splice and tap connectors that are compatible with conductor material.
- C. Wiring at Outlets: Install with at least 12 inches (300 mm) of slack conductor at each outlet.
- D. Connect outlets and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals according to tightening requirements specified in UL 486A.
- E. Install devices to securely and permanently fasten and support electrical components.
- F. Sleeves: Install for cable and raceway penetrations of concrete slabs and walls, except where core-drilled holes are used. Install for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.
- G. Firestopping: Apply to cable and raceway penetrations of fire-rated floor and wall assemblies. Perform firestopping as specified in Division 7 Section "Firestopping" to reestablish the original fire-resistance rating of the assembly at the penetration.
- H. Fastening: Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure. Perform fastening according to the following:
 - 1. Fasten by means of wood screws or screw-type nails on wood; toggle bolts on hollow masonry units; concrete inserts or expansion bolts on concrete or solid masonry; and by machine screws, welded threaded studs, or spring-tension clamps on steel.
 - 2. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts, machine screws, or wood screws.
 - 3. In partitions of light steel construction use sheet-metal screws.
 - 4. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof-test load.
- I. Install identification devices where required.
 - 1. For panelboards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker.

3.05 DEMOLITION

- A. Where electrical work to remain is damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- B. Accessible Work Indicated to Be Demolished: Remove exposed electrical installation in its entirety.
- C. Abandoned Work: Cut and remove buried raceway and wiring indicated to be abandoned in place, 2 inches (50 mm) below the surface of adjacent construction. Cap and patch surface to match

existing finish.

D. Removal: Remove demolished material from the Project site.

END OF SECTION 16050

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