SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Building wires and cables rated 600 V and less.
   2. Connectors, splices, and terminations rated 600 V and less.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.03 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 CONDUCTORS AND CABLES

A. Copper Conductors: Comply with NEMA WC 70.

B. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN, XHHW.

C. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad cable, Type MC with ground wire.

D. Fire Alarm, Class 1 and Class 2 Control System Wiring: Solid copper wire, single conductors, rated 600 volts.

E. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AFC Cable Systems, Inc.
   2. Cablex, Inc.
   3. Pirelli Cable Corp.
   4. General Cable Corp.
   5. Alliance Cable.

2.02 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Thomas and Betts..
   2. Hubbell Power Systems, Inc.
   3. O-Z/Gedney.
   4. 3M; Electrical Products Division.
   5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

C. For copper wire No 14 through No. 8 AWG, solid or stranded, furnish screw-on pressure type connectors incorporating zinc-coated spring and insulating vinyl jacket with skirt.

D. For copper wire No. 6 AWG and larger, furnish bolt-on mechanical lugs with hex socket screws.

PART 3 - EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders and Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.02 CONDUCTOR APPLICATIONS AND WIRING METHODS

A. Service Entrance and feeders below Slabs-on-Grade, and Underground: Type XHHW, single conductors in raceway.

B. Exposed Feeders and Branch Circuits: Type THHN-THWN in dry locations, and type THWN or XHHW in wet locations, single conductors in raceway.

C. Feeders and Branch Circuits Concealed in Ceilings, Walls and Partitions: Type THHN-THWN, single conductors in raceway or metal-clad cable, Type MC.

D. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

E. Low Tension Wiring:

   1. Conductor Size: Circuits at 120 volt AC: Minimum #14 AWG wire.

   2. Circuits at 24 volt AC or DC: Minimum size as required by system manufacturer.

   3. Insulation: Types THHN or THWN for conductors #14 AWG and larger installed in raceway.

4. Fire alarm wiring: In the conduits or metal clad cable (Type MC) UL listed and approved for fire-protective signaling circuits where is allowed by the Code.

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Install all power and 120 volt control wire and cable in approved raceways and as approved by Authorities having jurisdiction. When low tension wiring is run exposed, install it in conduit. Plenum rated low tension cable may be used for installation above suspended ceilings.

B. Wire Size: Install minimum No. 12 AWG for power and lighting circuits; except install minimum No. 10 AWG for 120 volts 20 ampere branch circuits of more than 75 feet from first outlet to panelboard.

C. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

D. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

E. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

F. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

G. Support cables according to Division 26 Sections "Hangers and Supports for Electrical Systems."

H. MC type Cable Supports:

1. Support and secure metal-clad cable Type MC at intervals not exceeding 6 feet and within 12 inches from every outlet box, junction box or cabinet.

2. Support metal clad cable Type MC with cable supports equal to Caddy WMX-6, MX-3, and clamps equal to Caddy 449. Where cables are supported by the structure and only need securing in place, then cable ties will be acceptable.

I. Identify conductors and cables according to Division 26 Section "Identification for Electrical Systems."

J. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

K. Make splices and taps that are compatible with conductor material.

L. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.04 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

3.05 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification.
   2. After installing conductors and cables and before electrical circuitry has been energized, perform insulation-resistance test on each power conductor with respect to ground and adjacent conductors. Applied potential to be 1,000 volts dc for one minute. Perform continuity test to insure correct cable connection. Minimum insulation-resistance values shall be not less than 50-megohms.

C. Test Reports: Prepare a written report to record the following:
   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 05 19