SECTION 260519 - LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. This section is a Division 26 Basic Electrical Materials and Methods section, and is part of each Division 26 section making reference to electrical wires and cables specified herein.

1.02 SCOPE OF WORK

A. The work shall include all labor and material for feeder, branch circuit and control wiring required by Division 26 of the Contract Documents. Extent of electrical wire and cable work is indicated by drawings and schedules.

B. Wiring for specific purposes, such as fire alarm system, shall be as specified in other sections.

PART 2 - PRODUCTS

2.01 CONDUCTOR MATERIAL, SIZE AND INSULATION

A. Wire and cables for feeder and branch circuits shall be single annealed stranded copper conductors with conductivity of not less than 98 percent at 20 degrees C. Wire and cable shall bear the UL label and shall meet or exceed the requirements of IPCEA-NEMA Standards S-19-81 and ASTM D-1352.

B. Wire sizes shall generally be as follows:

1. Control and interlock wiring No. 14 AWG.

2. Branch circuit and feeder wiring No. 12 AWG and larger.

C. Wire and cable insulation shall be as follows:

1. Conductors size No. 14 AWG through No. 4/0 AWG shall be 600 Volt type THWN for dry and wet locations with a maximum operating temperature of 75 degrees C.

2. Conductors size 250 MCM and larger shall be 600 Volt type THHN/THWN or XHHW for dry and wet locations with a maximum operating temperature of 90 and 75 degrees C., respectively.

D. For convenience in testing and maintenance all secondary conductors shall be color coded in accordance with the established building standard, or if no standard exists, in accordance with the following schedule:

1. 208/120 Volt Systems

Phase A	Black
Phase B	Red
Phase C	Blue
Neutral	White
Ground	Green

2. 480/277 Volt Systems

Phase A	Brown
Phase B	Orange
Phase C	Yellow
Neutral	White with Stripe
Ground	Green

3. Control circuit wiring shall have separate identifying colors or numbers.

2.02 METAL-CLAD CABLE TYPE MC

A. Metal-clad cable (type MC) shall be copper, multi conductor type, with no more than eight conductors. The interlocking sheath shall be of either galvanized steel or aluminum. Conductors shall be soft-annealed copper, meeting ASTM B3, and stranded as per ASTM B8. Type MC cable shall be UL labeled.

B. Type MC shall comply with all applicable codes and standards, including UL 1569, UL 83, ASTM 815, Fed. JC 30B, and NEC Articles 300-22(c) and 334.

C. The grounding conductor shall be insulated and shall be routed with the circuit conductors. They shall be sized and identified per UL 1569.

D. The cable shall be assembled by twisting and covering the conductor bundle with a polyester tape.

2.03 CONNECTORS

A. Provide UL labeled connectors of ampacity ratings and types for applications indicated.

1. Connections for wire sizes No. 14 AWG through No. 10 AWG shall be made with 3-M "SCOTCHLOK" spring connectors.

2. Conductors No. 8 AWG and larger shall be spliced and tapped with COLOR-KEYED wrought copper compression connectors as manufactured by Thomas & Betts. The manufacturer's recommended tooling shall be used for installation. Long barrel sleeves, two hole lugs and "C" type connectors shall be used. Splice and tap connectors shall be compatible with conductor material.

PART 3 - EXECUTION

3.01 INSTALLATION OF WIRES AND CABLES

A. Electrical cables, wires and connectors shall be installed in compliance with applicable requirements of NEC, NEMA, UL and NECA's "Standard of Installation" and in accordance with recognized industry practices.

B. Conductors shall be pulled simultaneously where more than one is being installed in the same raceway. U.L. approved pulling compound or lubricant shall be used where necessary.

C. Splices shall be insulated with a minimum of two half-lapped layers of "SCOTCH" Brand No. 33 Vinyl Plastic Electric Tape or molded plastic boots. All connectors having irregular surfaces shall be padded with "SCOTCHFIL" Brand Putty or "SCOTCH" Brand No. 23 Tape prior to insulating.

D. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tightening torques shall comply with those specified in UL Standard 486A and B.

E. Unless specifically indicated otherwise, each single phase branch circuit shall consist of respective phase conductor and a dedicated neutral conductor.

F. Provide a separate "GREEN" insulated ground wire in each feeder, branch circuit and other conduits containing current carrying conductors.

3.02 INSTALLATION OF MC CABLES

A. Type MC cables shall be permissible for installation of indoor branch circuits not more than 30 amperes above accessible ceiling and in hollow drywall partitions, without being installed in raceways, if permissible by Code. Type MC cables shall not be installed exposed, including in electrical closets.

B. Type MC cable shall be supported and secured not exceeding every 6-feet, and shall be secured within 12-inches of every box, cabinet, or fitting for cables.

C. Type MC cable shall not be used in health care facilities.

3.03 WIRE AND CABLE IDENTIFICATION

A. Identification shall be as specified in Section 260553 and shall include the following:

1. Feeder cables shall be laced together and identified by feeder number, voltage and conductor size in each wireway, junction or pull box. Individual conductors shall be identified by color code.

2. The cover of each junction and outlet box containing branch circuits shall be identified as to panel and circuit number.

END OF SECTION 260519