SECTION 16123 - BUILDING WIRE AND CABLE

GENERAL

1.1 SECTION INCLUDES

A. Building wire and cable.

B. Metal clad cable.

C. Wiring connectors and connections.

1.2 RELATED SECTIONS

A. Section 16111 - Conduit.

B. Section 16130 - Boxes.

1.3 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc.

1.5 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Conductor sizes are based on copper unless indicated as aluminum or "ALUM". Aluminum conductors may be substituted for copper only for the service entrance feeder, and for the panelboard feeders.

C. If Aluminum conductors are substituted for copper conductors, size conductors to match feeder requirements for conductor ampacity and voltage drop.

D. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.

E. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PRODUCTS

2.1 BUILDING WIRE AND CABLE

A. Acceptable Manufacturers:
1. Alcan (Aluminum).
2. Triangle PWC (Copper).
3. Substitutions: Or Approved Equal.

B. Description: Single Conductor insulated wire.

C. Conductor: Copper for sizes smaller than 4 AWG and smaller; or compact section aluminum for sizes 2 AWG and larger.

D. Insulation Voltage Rating: 600 volts.

E. Insulation Type: THW or XHHW.

F. Insulation Color: Color of all service, feeder, branch, motor control, and signaling circuit conductors shall be green for grounding conductors, and white for neutrals. The color of the ungrounded conductors in different voltage systems shall be as follows:

1.	120/208 volt, 3-phase:	Phase A - black
		Phase B – red
		Phase C - blue
2.	277/480 volt, 3-phase:	Phase A – brown
		Phase B – orange
		Phase C - yellow

2.2 METAL CLAD CABLE

A. Acceptable Manufacturers:
1. Triangle PWC.
2. Substitutions: Or Approved Equal.

B. Description: ANSI/NFPA 70, Type MC.

C. Conductor: Copper only.

D. Insulation Voltage Rating: 600 volts.

E. Insulation Temperature Rating: 60 degrees C.

F. Insulation Material: Thermoplastic.

G. Armor material: Steel or aluminum.

H. Armor Design: Interlocked metal tape.

I. Jacket: None.

2.3 WIRING CONNECTORS

A. Acceptable Manufacturers:
1. Burndy
2. 3M
3. Ideal
4. Thomas and Betts

EXECUTION

3.1 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.2 WIRING METHODS

A. Branch Circuits in Concealed Interior Locations: Use building wire in conduit as specified in Section 16111 or metal clad cable.

B. Branch Circuits in Exposed Interior Locations: Use only building wire in conduit as specified in Sections 16111.

C. Panelboard and Equipment Feeders: Use only building wire in conduit as specified in Section 16111.

D. Exterior Locations: Use only building wire in conduit as specified in Section 16111.

3.3 INSTALLATIONS

A. Install products in accordance with manufacturers' instructions.

B. Indications of wire sizes on Drawings are based on copper conductors. Where allowed under this Section, the Contractor may elect to substitute aluminum conductors; however, in such cases, wiring sizes shall be selected to provide equal (or greater) ampacity ratings to that for copper conductors, and conduit sizes shall be increased to provide 40% fill (maximum).

C. Use solid conductor for feeders and branch circuits 10 AWG and smaller.

D. Use stranded conductors for control circuits.

E. Use conductor not smaller than 12 AWG for power and lighting circuits.

F. Use conductor not smaller than 16 AWG for control circuits.

G. Use 10 AWG conductors for 20-ampere, 120-volt branch circuits longer than 75 feet, or for 20-ampere, 277-volt branch circuits longer than 200 feet.

H. Pull all conductors into raceway at same time.

I. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

J. Protect exposed cable from damage.

K. Support cables above accessible ceiling, using spring metal clips or cable ties to support cables from structure. Do not rest cable on ceiling panels.

L. Neatly train and lace wiring inside boxes, equipment, and panelboards.

M. Clean connector surfaces before installing lugs and connectors.

N. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

O. Terminate aluminum conductors with tin-plated aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.

P. Use suitable reducing connectors or mechanical connector adapters for connecting aluminum conductors to copper conductors.

Q. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

R. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

S. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

3.4 FIELD QUALITY CONTROL

A. Inspect wire and cable for physical damage and proper connection.

B. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

C. Verify continuity of each branch circuit conductor.

END OF SECTION