

## SECTION 16120 - CONDUCTORS AND CABLES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

## 1.3 SUBMITTALS

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

## 1.4 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

## 2.1 CONDUCTORS AND CABLES

- A. Conductor Material: Copper, except feeders No. 4 AWG and larger may be aluminum complying with NEMA WC. Minimum wire gauge shall be 12 gage, unless otherwise noted.
- B. Conductor Insulation Types: Type THW, THHN-THWN, XHHW complying with NEMA WC 5.
- C. Multiconductor Cable: Armored cable, Type AC, Metal-clad cable, Type MC.
  - 1. Provide type HCF, hospital grade cable in areas designated on the drawings as patient care areas.

## 2.2 CONNECTORS AND SPLICES

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

## PART 3 - EXECUTION

## 3.1 CONDUCTOR AND INSULATION APPLICATIONS

- A. Service Entrance: Type THHN-THWN, single conductors in raceway

- B. Feeders Concealed in Ceilings, Walls, and Partitions and in Crawlspace: Type THHN-THWN, single conductors in raceway or metal-clad cable, Type MC.
- C. Feeders Concealed in Concrete or below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.
- D. Exposed Branch Circuits, including in Crawlspace: Type THHN-THWN, single conductors in raceway, Armored cable, Type AC, Metal-clad cable, Type MC
- E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway, Armored cable, Type AC, Metal-clad cable, Type MC.
- F. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.
- G. Underground Feeders and Branch Circuits: Type THHN-THWN, single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.
- I. Fire Alarm Circuits: Type THHN-THWN, in raceway Type MC cable listed for fire alarm use and identified by factory-installed red finish or stripe on its outer jacket, Power-limited, fire-protective, signaling circuit cable as allowed by code and state and local authorities.
- J. Class 1 Control Circuits: Type THHN-THWN, in raceway, Armored cable, Type AC, Metal-clad cable, Type MC.
- K. Class 2 Control Circuits: Type THHN-THWN, in raceway or Power-limited cable, concealed in building finishes

### 3.2 INSTALLATION

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. 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.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."
- F. Seal around cables penetrating fire-rated elements according to Division 7.
- G. Identify and color-code conductors and cables according to Division 16 Section "Basic Electrical Materials and Methods."
- H. Separate neutral conductors shall be installed for each branch circuit, unless noted otherwise.

- I. For 120V circuits, home runs longer than 120 feet shall be minimum No. 10 AWG, longer than 200 feet shall be minimum No. 8 AWG, and longer than 290 feet shall be minimum No. 6 AWG. For 208V circuits, the above distances shall be doubled.
- 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 and UL 486B.
- K. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors
  - 2. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

### 3.3 FIELD QUALITY CONTROL

- A. Testing: Perform the following field quality-control testing:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
  - 2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters..

END OF SECTION 16120