First Revision No. 7512-NFPA 70-2018 [Global Input]

Insert new Article 890 per attached Word document.

Supplemental Information

File Name	Description	Approved
70_FR7512_Article890_new.docx	For Staff Use	✓
Future_Revisions_for_Chapter_8.docx	For public review only	✓
Global_FR-7512_Article_890_new_Panel_16.docx		✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 09:47:00 EST 2018

Committee Statement and Meeting Notes

Committee Statement: This proposed new Article combines common requirements currently found in Articles 800, 820, 830 and 840 into a new “general” article that applies to all of these articles. This new Article significantly improves clarity and usability.

The intent of the Panel is to delete the redundant requirements throughout Articles 800, 820, 830, and 840 at the Second Draft stage, once Article 890 has been established. The attached report indicates the future changes anticipated by the Panel.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 30, 2018	NEC-CMP Panel 16	Confirmed that this will be handled as a new Article.

Public Input No. 2858-NFPA 70-2017 [Global Input]

Public Input No. 3070-NFPA 70-2017 [Section No. 830.21]

Public Input No. 3047-NFPA 70-2017 [Section No. 800.100]

Public Input No. 3066-NFPA 70-2017 [Section No. 820.180]

Public Input No. 3090-NFPA 70-2017 [Section No. 830.179 [Excluding any Sub-Sections]]

Public Input No. 3046-NFPA 70-2017 [Section No. 800.49]

Public Input No. 3121-NFPA 70-2017 [Section No. 840.106]

Public Input No. 3051-NFPA 70-2017 [Section No. 800.180]

Public Input No. 3050-NFPA 70-2017 [Section No. 800.179 [Excluding any Sub-Sections]]

Public Input No. 3081-NFPA 70-2017 [Section No. 830.100]

Public Input No. 3103-NFPA 70-2017 [Section No. 840.44]

Public Input No. 3043-NFPA 70-2017 [Sections 800.21, 800.24, 800.25, 800.26]

Public Input No. 3053-NFPA 70-2017 [Section No. 820.2]

Public Input No. 3072-NFPA 70-2017 [Section No. 830.24]

Public Input No. 3044-NFPA 70-2017 [Section No. 800.44]

Public Input No. 3045-NFPA 70-2017 [Section No. 800.48]

Public Input No. 3054-NFPA 70-2017 [Section No. 820.3]

Public Input No. 3109-NFPA 70-2017 [Section No. 840.49]

Public Input No. 3064-NFPA 70-2017 [Section No. 820.106]

Public Input No. 3096-NFPA 70-2017 [Section No. 840.21]

Public Input No. 3041-NFPA 70-2017 [Section No. 800.2]

Public Input No. 3089-NFPA 70-2017 [Section No. 830.106]

Public Input No. 3100-NFPA 70-2017 [Sections 840.25, 840.26]

Public Input No. 3094-NFPA 70-2017 [Section No. 840.3]

Public Input No. 3056-NFPA 70-2017 [Section No. 820.44]

Public Input No. 3122-NFPA 70-2017 [Section No. 840.180]

Public Input No. 3069-NFPA 70-2017 [Section No. 830.3]

Public Input No. 3068-NFPA 70-2017 [Section No. 830.2]

Public Input No. 3097-NFPA 70-2017 [Section No. 840.24]

Public Input No. 3067-NFPA 70-2017 [Article 830 [Excluding any Sub-Sections]]

Public Input No. 3120-NFPA 70-2017 [Section No. 840.100]

Public Input No. 3052-NFPA 70-2017 [Article 820 [Excluding any Sub-Sections]]

Public Input No. 3042-NFPA 70-2017 [Section No. 800.3]

Public Input No. 3106-NFPA 70-2017 [Section No. 840.48 [Excluding any Sub-Sections]]

Public Input No. 3040-NFPA 70-2017 [Article 800 [Excluding any Sub-Sections]]

Public Input No. 3073-NFPA 70-2017 [Sections 830.25, 830.26]

Public Input No. 3049-NFPA 70-2017 [Section No. 800.106]

Public Input No. 3075-NFPA 70-2017 [Section No. 830.44]

Public Input No. 3092-NFPA 70-2017 [Section No. 840.2 [Excluding any Sub-Sections]]

Public Input No. 3065-NFPA 70-2017 [Section No. 820.179 [Excluding any Sub-Sections]]

Public Input No. 3059-NFPA 70-2017 [Section No. 820.49]

Public Input No. 3079-NFPA 70-2017 [New Section after 830.47]

Public Input No. 3058-NFPA 70-2017 [Section No. 820.48]

Public Input No. 3091-NFPA 70-2017 [Section No. 830.180]

Public Input No. 3055-NFPA 70-2017 [Sections 820.21, 820.24, 820.25, 820.26]

Public Input No. 3080-NFPA 70-2017 [Section No. 830.49]

Public Input No. 3060-NFPA 70-2017 [Section No. 820.100]

Editorial Comment

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This document depicts the revisions that CMP 16 intends to take in Articles 800, 820, 830, and 840 at the Second Draft Stage, contingent upon the successful incorporation of new Article 890. These are presented for public review, in order to give context to the new article.

Note that this document includes only those sections that will be affected in each article.

Article 800

Communications Circuits

800.2 Definitions. See Part I of Article 100 and Article 890.2. The definitions in this section shall apply only within this article.

Abandoned Communications Cable. Installed communications cable that is not terminated at both ends at a connector or other equipment and not identified for future use with a tag.

Block. A square or portion of a city, town, or village enclosed by streets and including the alleys so enclosed, but not any street.

Cable. A factory assembly of two or more conductors having an overall covering.

Cable Sheath. A covering over the conductor assembly that may include one or more metallic members, strength members, or jackets.

Communications Circuit. The circuit that electrically extends service from the communications utility or service provider up to and including the customer's communications equipment.

Communications Circuit Integrity (CI) Cable. Cable used in communications systems to ensure continued operation of critical circuits during a specified time under fire conditions.

~~**Exposed (to Accidental Contact).** A circuit that is in such a position that, in case of failure of supports or insulation, contact with another circuit may result.~~

~~Informational Note: See Part I of Article 100 for two other definitions of *Exposed*.~~

~~**Point of Entrance.** The point within a building at which the communications wire or cable emerges from an external wall or from a concrete floor slab.~~

~~**Premises.** The land and buildings of a user located on the user side of the utility-user network point of demarcation.~~

Wire. A factory assembly of one or more insulated conductors without an overall covering.

800.3 Other Articles. Installations of communications circuits and equipment shall comply with 800.3(A) through (~~G~~B). Only those sections of Chapters 1 through 7 referenced in Article 800 shall apply to communications circuits and equipment.

(A) General Requirements. The general requirements of Article 890 shall apply.

~~**(A) Hazardous (Classified) Locations.** Communications circuits and equipment installed in a location that is classified in accordance with 500.5 and 505.5 shall comply with the applicable requirements of Chapter 5.~~

~~**(B) Wiring in Ducts for Dust, Loose Stock, or Vapor Removal.** The requirements of 300.22(A) shall apply.~~

~~**(C) Equipment in Other Space Used for Environmental Air.** The requirements of 300.22(C)(3) shall apply.~~

~~**(D) Installation and Use.** The requirements of 110.3(B) shall apply.~~

~~**(E) Network-Powered Broadband Communications Systems.** Article 830 shall apply to network-powered broadband communications systems.~~

~~**(F) Premises-Powered Broadband Communications Systems.** Article 840 shall apply to premises-powered broadband communications systems.~~

(~~G~~B) Optical Fiber Cable. Where optical fiber cable is used, either in whole or in part, to provide a communications circuit within a building, Article 770 shall apply to the installation of the optical fiber portion of the communications circuit.

~~**800.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.** Access to electrical equipment shall not be denied by an accumulation of communications wires and cables that prevents removal of panels, including suspended ceiling panels.~~

~~**800.24 Mechanical Execution of Work.** Communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4(D) and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).~~

~~Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA-568.1-D-2015, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards.~~

~~Informational Note No. 2: See NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).~~

~~Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of communications wire and cable properties.~~

~~**800.25 Abandoned Cables.** The accessible portion of abandoned communications cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.~~

~~**800.26 Spread of Fire or Products of Combustion.** Installations of communications cables, communications raceways, cable routing assemblies in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations of communications cables, communications raceways, and cable routing assemblies through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.~~

~~Informational Note: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire resistance–rated wall assembly. An example is the 600 mm (24 in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 800.26 can be found in building codes, fire resistance directories, and product listings.~~

~~**800.27 Temperature Limitation of Wires and Cables.** No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.~~

800.44 Overhead (Aerial) Communications Wires and Cables. Overhead (aerial) communications wires and cables entering buildings shall comply with 890.44(A) and 800.44(A) and (B).

(A) On Poles and In-Span. Where communications wires and cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 800.44(A)(1) ~~through 800.44(A)(4)~~ shall be met.

~~**(1) Relative Location.** Where practicable, the communications wires and cables shall be located below the electric light or power conductors.~~

~~**(2) Attachment to Cross-Arms.** Communications wires and cables shall not be attached to a cross-arm that carries electric light or power conductors.~~

~~**(3) Climbing Space.** The climbing space through communications wires and cables shall comply with the requirements of 225.14(D).~~

(41) Clearance. Supply service drops and sets of overhead service conductors of 0 to 750 volts running above and parallel to communications service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of and at their attachment to the building, provided that the ungrounded conductors are insulated and that a clearance of not less than 1.0 m (40 in.) is maintained between the two services at the pole.

(B) Above Roofs. Communications wires and cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: Communications wires and cables shall not be required to have a vertical clearance of not less than 2.5 m (8 ft) above auxiliary buildings, such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if (a) not more than 1.2 m (4 ft) of communications service-drop conductors pass above the roof overhang and (b) they are terminated at a through- or above-the-roof raceway or approved support.

Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

Informational Note: For additional information regarding overhead (aerial) wires and cables, see ANSI/IEEE C2-2012, *National Electrical Safety Code*, *Part 2, Safety Rules for Overhead Lines*.

800.48 Unlisted Cables Entering Buildings. Unlisted outside plant communications cables shall be ~~permitted to be installed in building spaces other than risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air, where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is~~ terminated in an enclosure or on a listed primary protector. ~~The point of entrance shall be permitted to be extended from the penetration of the external wall or floor slab by continuously enclosing the entrance cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.~~

Informational Note No. 1: Splice cases or terminal boxes, both metallic and plastic types, are typically used as enclosures for splicing or terminating telephone cables.

Informational Note No. 2: This section limits the length of unlisted outside plant cable to 15 m (50 ft), while 800.90(B) requires that the primary protector be located as close as practicable to the point at which the cable enters the building. Therefore, in installations requiring a primary protector, the outside plant cable may not be permitted to extend 15 m (50 ft) into the building if it is practicable to place the primary protector closer than 15 m (50 ft) to the point of entrance.

~~**800.49 Metal Entrance Conduit Grounding.** Metal conduit containing communications entrance wire or cable shall be connected by a bonding conductor or grounding electrode conductor to the building grounding electrode system in accordance with 800.100(B).~~

800.100 Cable and Primary Protector Bonding and Grounding. The primary protector and the metallic member(s) of the cable sheath shall be bonded or grounded as specified in 890.100 and 800.100(A) ~~through 800.100(D)~~.

(A) Bonding Conductor or Grounding Electrode Conductor.

~~**(1) Insulation.** The bonding conductor or grounding electrode conductor shall be listed and shall be permitted to be insulated, covered, or bare.~~

~~**(2) Material.** The bonding conductor or grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.~~

(~~3~~1) Size. The bonding conductor or grounding electrode conductor shall ~~not be smaller than 14 AWG. It shall~~ have a current-carrying capacity not less than the grounded metallic sheath member(s) and protected conductor(s) of the communications cable. ~~The bonding conductor or grounding electrode conductor shall not be required to exceed 6 AWG.~~

~~**(4) Length.** The primary protector bonding conductor or grounding electrode conductor shall be as short as practicable. In one- and two-family dwellings, the primary protector bonding conductor or grounding electrode conductor shall be as short as practicable, not to exceed 6.0 m (20 ft) in length.~~

~~Informational Note: Similar bonding conductor or grounding electrode conductor length limitations applied at apartment buildings and commercial buildings help to reduce voltages that may be developed between the building's power and communications systems during lightning events.~~

~~*Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum primary protector bonding conductor or grounding electrode conductor length of 6.0 m (20 ft), a separate communications ground rod meeting the minimum dimensional criteria of 800.100(B)(3)(2) shall be driven, the primary protector shall be connected to the communications ground rod in accordance with 800.100(C), and the communications ground rod shall be connected to the power grounding electrode system in accordance with 800.100(D).*~~

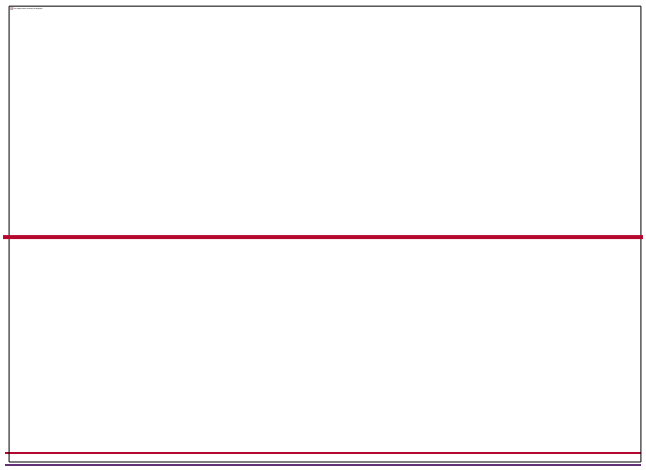
~~**(5) Run in Straight Line.** The bonding conductor or grounding electrode conductor shall be run in as straight a line as practicable.~~

~~**(6) Physical Protection.** Bonding conductors and grounding electrode conductors shall be protected where exposed to physical damage. Where the bonding conductor or grounding electrode conductor is installed in a metal raceway, both ends of the raceway shall be bonded to the contained conductor or to the same terminal or electrode to which the bonding conductor or grounding electrode conductor is connected.~~

~~**(B) Electrode.** The bonding conductor or grounding electrode conductor shall be connected in accordance with 800.100(B)(1), 800.100(B)(2), or 800.100(B)(3).~~

~~Informational Note: The following figure illustrates the connection of the bonding conductor in buildings or structures equipped with an intersystem bonding termination or a terminal block providing access to the building grounding means.~~

~~Informational Note Illustration of a Bonding Conductor in a Communications Installation.~~



~~**(1) In Buildings or Structures with an Intersystem Bonding Termination.** If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.~~

~~**(2) In Buildings or Structures with Grounding Means.** If an intersystem bonding termination is established, 250.94(A) shall apply.~~

~~If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:~~

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible metal power service raceway

(5) The service equipment enclosure

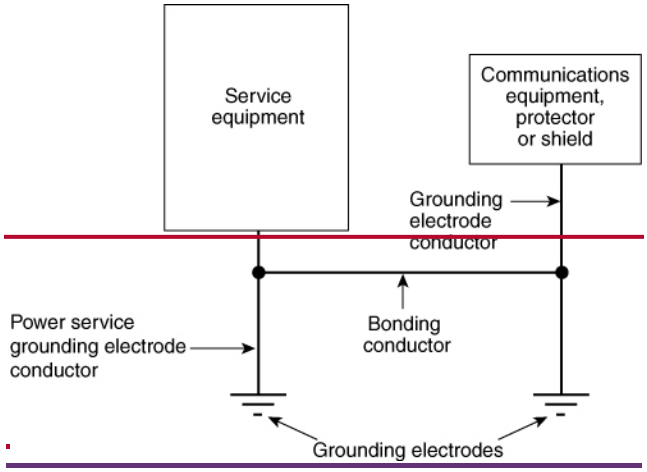
(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is connected to a grounding electrode as covered in 250.32

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.

Informational Note: The following figure illustrates the connection of the bonding conductor in buildings or structures not equipped with an intersystem bonding termination or terminal block providing access to the building grounding means.

Informational Note Illustration of a Grounding Electrode Conductor in a Communications Installation.



For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 800.90(B), shall be considered accessible.

(3) In Buildings or Structures Without an Intersystem Bonding Termination or Grounding Means. If the building or structure served has no intersystem bonding termination or grounding means, as described in 800.100(B)(2), the grounding electrode conductor shall be connected to either of the following:

(1) To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or (A)(4).

(2) If the building or structure served has no intersystem bonding termination or has no grounding means, as described in 800.100(B)(2) or (B)(3)(1), to any one of the individual grounding electrodes described in 250.52(A)(7) and (A)(8) or to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (**1/2** in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning protection system conductors as covered in 800.53 and at least 1.8 m (6 ft) from electrodes of other systems. Steam, hot water pipes, or lightning protection system conductors shall not be employed as electrodes for protectors and grounded metallic members.

(C) Electrode Connection. Connections to grounding electrodes shall comply with 250.70.

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the communications grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used.

Exception: At mobile homes as covered in 800.106.

~~Informational Note No. 1: See 250.60for connection to a lightning protection system.~~

~~Informational Note No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.~~

800.179 Communications Wires and Cables. Communications wires and cables shall be listed in accordance with 800.179(A) through (J) and marked in accordance with Table 800.179. Conductors in communications cables, other than in a coaxial cable, shall be copper.

Communications wires and cables shall have a voltage rating of not less than 300 volts. The insulation for the individual conductors, other than the outer conductor of a coaxial cable, shall be rated for 300 volts minimum. The cable voltage rating shall not be marked on the cable or on the undercarpet communications wire. ~~Communications wires and cables shall have a temperature rating of not less than 60°C (140°F). The temperature rating shall be marked on the jacket of communications cables that have a temperature rating exceeding 60°C (140°F).~~

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

Informational Note: Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.

Table 800.179 Cable Markings

Cable Marking	Type
CMP	Communications plenum cable
CMR	Communications riser cable
CMG	Communications general-purpose cable
CM	Communications general-purpose cable
CMX	Communications cable, limited use
CMUC	Under-carpet communications wire and cable

Informational Note: Cable types are listed in descending order of fire performance.

(A) Type CMP. Type CMP communications plenum cables shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

Informational Note: One method of defining a cable that is low-smoke producing cable and fire-resistant cable is that the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-2015, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*.

(B) Type CMR. Type CMR communications riser cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2011, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*.

(C) Type CMG. Type CMG general-purpose communications cables shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

(D) Type CM. Type CM communications cables shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Flame Tray Test" in ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

(E) Type CMX. Type CMX limited-use communications cables shall be listed as being suitable for use in dwellings and for use in raceway and shall also be listed as being resistant to flame spread.

Informational Note: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2011, *Reference Standard for Electrical Wires, Cables and Flexible Cords*.

(F) Type CMUC Undercarpet Wires and Cables. Type CMUC undercarpet communications wires and cables shall be listed as being suitable for undercarpet use and shall also be listed as being resistant to flame spread.

Informational Note: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2011, *Reference Standard for Electrical Wires, Cables and Flexible Cords*.

(G) Circuit Integrity (CI) Cable or Electrical Circuit Protective System. Cables that are used for survivability of critical circuits under fire conditions shall be listed and meet either 800.179(G)(1) or 800.179(G)(2) as follows:

Informational Note: The listing organization provides information for circuit integrity (CI) cable and electrical circuit protective systems, including installation requirements required to maintain the fire rating.

(1) Circuit Integrity (CI) Cables. Circuit integrity (CI) cables specified in 800.179(A) through (D), and used for survivability of critical circuits, shall have an additional classification using the suffix "CI." In order to maintain its listed fire rating, circuit integrity (CI) cable shall only be installed in free air.

Informational Note: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with ANSI/UL 2196-2006, *Standard for Tests of Fire-Resistive Cable*.

(2) Fire-Resistive Cables. Cables specified in 800.179(A) through (D) and 800.179(G)(1), that are part of an electrical circuit protective system, shall be fire-resistive cable identified with the protective system number on the product, or on the smallest unit container in which the product is packaged, and shall be installed in accordance with the listing of the protective system.

Informational Note No. 1: One method of defining an electrical circuit protective system is by establishing a minimum 2-hour fire resistance rating for the system when tested in accordance with UL Subject 1724, *Outline of Investigation for Fire Tests for Electrical Circuit Protective Systems*.

Informational Note No. 2: The listing organization provides information for electrical circuit protective systems (FHIT), including installation requirements for maintaining the fire rating.

(H) Types CMP-LP, CMR-LP, CMG-LP and CM-LP Limited Power (LP) Cables. Types CMP-LP, CMR-LP,CMG-LP and CM-LP communications limited power cables shall be listed as suitable for carrying power and data up to a specified current limit for each conductor without exceeding the temperature rating of the cable where the cable is installed in cable bundles in free air or installed within a raceway, cable tray, or cable routing assembly. The cables shall be marked with the suffix "-LP(XXA)", where XX designates the current limit in amperes per conductor.

Informational Note: An example of the marking on a communications cable with an LP rating is "CMP-LP (0.6A)(75°C) 23AWG 4 pair," which indicates that it is a 4-pair plenum cable with 23 AWG conductors, a temperature rating of 75°C and a current limit of 0.6 ampere.

(I) Communications Wires. Communications wires, such as distributing frame wire and jumper wire, shall be listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Flame Tray Test" in ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test— Cables in Cable Trays," as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

(J) Hybrid Power and Communications Cables. Listed hybrid power and communications cables shall be permitted where the power cable is a listed Type NM or NM-B, conforming to Part III of Article 334, and the communications cable is a listed Type CM, the jackets on the listed NM or NM-B, and listed CM cables are rated for 600 volts minimum, and the hybrid cable is listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Flame Tray Test" in ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

~~**800.180 Grounding Devices.** Where bonding or grounding is required, devices used to connect a shield, a sheath, or non–current-carrying metallic members of a cable to a bonding conductor or grounding electrode conductor shall be listed or be part of listed equipment.~~

Article 820

Community Antenna Television and Radio Distribution Systems

820.2 Definitions. See Part I of Article 100 and 890.2. The definitions in this section shall apply only within Article 820.

Abandoned Coaxial Cable. Installed coaxial cable that is not terminated at equipment other than a coaxial connector and not identified for future use with a tag.

~~**Exposed (to Accidental Contact).** A circuit in such a position that, in case of failure of supports and or insulation, contact with another circuit may result.~~

~~Informational Note: See Part I of Article 100 for two other definitions of *Exposed*.~~

~~**Point of Entrance.** The point within a building at which the coaxial cable emerges from an external wall or from a concrete floor slab.~~

~~**Premises.** The land and buildings of a user located on the user side of utility-user network point of demarcation.~~

820.3 Other Articles. Circuits and equipment shall comply with 820.3(A) through (~~I~~B). Only those sections of Chapters 1 through 7 referenced in Article 820 shall apply to community antenna television and radio distribution systems.

(A) General Requirements. The general requirements of Article 890 shall apply.

~~**(A) Hazardous (Classified) Locations.** CATV equipment installed in a location that is classified in accordance with 500.5 and 505.5 shall comply with the applicable requirements of Chapter 5.~~

~~**(B) Wiring in Ducts for Dust, Loose Stock, or Vapor Removal.** The requirements of 300.22(A) shall apply.~~

~~**(C) Equipment in Other Space Used for Environmental Air.** The requirements of 300.22(C)(3) shall apply.~~

~~**(D) Installation and Use.** The requirements of 110.3(B) shall apply.~~

(~~E~~B) Installations of Conductive and Nonconductive Optical Fiber Cables. The requirements of Article 770 shall apply.

~~**(F) Communications Circuits.** The requirements of Article 800 shall apply.~~

~~**(G) Network-Powered Broadband Communications Systems.** The requirements of Article 830 shall apply.~~

~~**(H) Premises-Powered Broadband Communications Systems.** The requirements of Article 840 shall apply.~~

(~~I~~C) Alternate Wiring Methods. The wiring methods of Article 830 shall be permitted to substitute for the wiring methods of Article 820.

Informational Note: Use of Article 830 wiring methods will facilitate the upgrading of Article 820 installations to network-powered broadband applications.

~~**820.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.** Access to electrical equipment shall not be denied by an accumulation of coaxial cables that prevents removal of panels, including suspended ceiling panels.~~

~~**820.24 Mechanical Execution of Work.** Community television and radio distribution systems shall be installed in a neat and workmanlike manner. Coaxial cables installed exposed on the surface of ceiling and sidewalls shall be supported by the building structure in such a manner that the cables will not be damaged by normal building use. Such cables shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform to 300.4(D) and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).~~

~~Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568–2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA-568.1-D-2015, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards.~~

~~Informational Note No. 2: See NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).~~

~~Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of coaxial cable properties.~~

~~**820.25 Abandoned Cables.** The accessible portion of abandoned coaxial cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.~~

~~**820.26 Spread of Fire or Products of Combustion.** Installations of coaxial cables and communications raceways in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations of coaxial cables and communications raceways through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.~~

~~Informational Note: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire resistance–rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 820.26 can be found in building codes, fire resistance directories, and product listings.~~

~~**820.27 Temperature Limitations of Wires and Cables.** No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.~~

820.44 Overhead (Aerial) Coaxial Cables. Overhead (aerial) coaxial cables, prior to the point of grounding, as specified in 820.93, shall comply with 890.44(A) and 820.44(A) through 820.44(E).

(A) On Poles and In-Span. Where coaxial cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 820.44(A)(1) ~~through 820.44(A)(4)~~ shall be met.

~~**(1) Relative Location.** Where practicable, the coaxial cables shall be located below the electric light or power conductors.~~

~~**(2) Attachment to Cross-Arms.** Coaxial cables shall not be attached to cross-arm that carries electric light or power conductors.~~

~~**(3) Climbing Space.** The climbing space through coaxial cables shall comply with the requirements of 225.14(D).~~

(41) Clearance. Lead-in or overhead (aerial) -drop coaxial cables from a pole or other support, including the point of initial attachment to a building or structure, shall be kept away from electric light, power, Class 1, or non–power-limited fire alarm circuit conductors so as to avoid the possibility of accidental contact.

Exception: Where proximity to electric light, power, Class 1, or non–power-limited fire alarm circuit conductors cannot be avoided, the installation shall provide clearances of not less than 300 mm (12 in.) from electric light, power, Class 1, or non–power-limited fire alarm circuit conductors. The clearance requirement shall apply at all points along the drop, and it shall increase to 1.0 m (40 in.) at the pole.

(B) Above Roofs. Coaxial cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: Vertical clearance requirements shall not apply to auxiliary buildings such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if (1) not more than 1.2 m (4 ft) of communications service drop conductors pass above the roof overhang, and (2) they are terminated at a raceway mast or other approved support.

Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

(C) On Masts. Overhead (aerial) coaxial cables shall be permitted to be attached to an above-the-roof raceway mast that does not enclose or support conductors of electric light or power circuits.

(D) Between Buildings. Coaxial cables extending between buildings or structures, and also the supports or attachment fixtures, shall be identified and shall have sufficient strength to withstand the loads to which they might be subjected.

Exception: Where a coaxial cable does not have sufficient strength to be self-supporting, it shall be attached to a supporting messenger cable that, together with the attachment fixtures or supports, shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

(E) On Buildings. Where attached to buildings, coaxial cables shall be securely fastened in such a manner that they will be separated from other conductors in accordance with 820.44(E)(1), 820.44(E)(2), and 820.44(E)(3).

(1) Electric Light or Power. The coaxial cable shall have a separation of at least 100 mm (4 in.) from electric light, power, Class 1, or non–power-limited fire alarm circuit conductors not in raceway or cable, or shall be permanently separated from conductors of the other system by a continuous and firmly fixed nonconductor in addition to the insulation on the wires.

(2) Other Communications Systems. Coaxial cable shall be installed so that there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the conductors, cables, messenger strand, or equipment of one system cause abrasion to the conductors, cable, messenger strand, or equipment of any other system.

(3) Lightning Conductors. Where practicable, a separation of at least 1.8 m (6 ft) shall be maintained between any coaxial cable and lightning conductors.

Informational Note No. 1: For additional information regarding overhead (aerial) wires and cables, see ANSI C2-2012, *National Electrical Safety Code*, Part 2, Safety Rules for Overhead Lines.

Informational Note No. 2: See Section 4.6 of NFPA 780-2014, *Standard for the Installation of Lightning Protection Systems*, for the calculation of sideflash distance.

820.48 Unlisted Cables Entering Buildings. Unlisted outside plant coaxial cables shall be ~~permitted to be installed in building spaces other than risers, ducts used for environmental air, plenums used for environmental air, and other~~

~~spaces used for environmental air, where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is~~ terminated at a grounding block. ~~The point of entrance shall be permitted to be extended from the penetration of the external wall or floor slab by continuously enclosing the entrance cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.~~

~~**820.49 Metal Entrance Conduit Grounding.** Metal conduit containing entrance coaxial cable shall be connected by a bonding conductor or grounding electrode conductor to the building grounding electrode system in accordance with 820.100(B).~~

820.100 Cable Bonding and Grounding. The shield of the coaxial cable shall be bonded or grounded as specified in 890.100 and 820.100(A) through (~~E~~B).

Exception: For communications systems using coaxial cable completely contained within the building (i.e., they do not exit the building) or the exterior zone of protection defined by a 46 m (150 ft) radius rolling sphere and isolated from outside cable plant, the shield shall be permitted to be grounded by a connection to an equipment grounding conductor as described in 250.118. Connecting to an equipment grounding conductor through a grounded receptacle using a dedicated bonding jumper and a permanently connected listed device shall be permitted. Use of a cord and plug for the connection to an equipment grounding conductor shall not be permitted.

Informational Note: See 4.8.3.1 of NFPA 780-2014, *Standard for the Installation of Lightning Protection Systems,* for the theory of the term *rolling sphere*.

(A) Bonding Conductor or Grounding Electrode Conductor.

~~**(1) Insulation.** The bonding conductor or grounding electrode conductor shall be listed and shall be permitted to be insulated, covered, or bare.~~

~~**(2) Material.** The bonding conductor or grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.~~

(~~3~~1) Size. The bonding conductor or grounding electrode conductor shall ~~not be smaller than 14 AWG. It shall~~ have a current-carrying capacity not less than the outer sheath of the coaxial cable. ~~The bonding conductor or grounding electrode conductor shall not be required to exceed 6 AWG.~~

~~**(4) Length.** The bonding conductor or grounding electrode conductor shall be as short as practicable. In one- and two-family dwellings, the bonding conductor or grounding electrode conductor shall be as short as practicable, not to exceed 6.0 m (20 ft) in length.~~

~~Informational Note: Similar bonding conductor or grounding electrode conductor length limitations applied at apartment buildings and commercial buildings help to reduce voltages that may be developed between the building's power and communications systems during lightning events.~~

~~*Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum bonding conductor or grounding electrode conductor length of 6.0 m (20 ft), a separate grounding electrode as specified in 250.52(A)(5), (A)(6), or (A)(7) shall be used, the grounding electrode conductor shall be connected to the separate grounding electrode in accordance with 250.70, and the separate grounding electrode shall be connected to the power grounding electrode system in accordance with 820.100(D).*~~

~~**(5) Run in Straight Line.** The bonding conductor or grounding electrode conductor shall be run in as straight a line as practicable.~~

~~**(6) Physical Protection.** Bonding conductors and grounding electrode conductors shall be protected where exposed to physical damage. Where the bonding conductor or grounding electrode conductor is installed in a metal raceway, both ends of the raceway shall be bonded to the contained conductor or to the same terminal or electrode to which the bonding conductor or grounding electrode conductor is connected.~~

~~**(B) Electrode.** The bonding conductor or grounding electrode conductor shall be connected in accordance with 820.100(B)(1), 820.100(B)(2), or 820.100(B)(3).~~

~~**(1) In Buildings or Structures with an Intersystem Bonding Termination.** If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.~~

~~**(2) In Buildings or Structures with Grounding Means.** If an intersystem bonding termination is established, 250.94(A) shall apply.~~

~~If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:~~

~~(1) The building or structure grounding electrode system as covered in 250.50~~

~~(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52~~

~~(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception~~

~~(4) The nonflexible metal power service raceway~~

~~(5) The service equipment enclosure~~

~~(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service~~

~~(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is connected to an electrode as covered in 250.32~~

~~A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.~~

~~For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 820.93, shall be considered accessible.~~

~~**(3) In Buildings or Structures Without an Intersystem Bonding Termination or Grounding Means.** If the building or structure served has no intersystem bonding termination or grounding means, as described in 820.100(B)(2), the grounding electrode conductor shall be connected to either of the following:~~

~~(1) To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or (A)(4).~~

~~(2) If the building or structure served has no intersystem bonding termination or grounding means, as described in 820.100(B)(2) or (B)(3)(1), to any one of the individual grounding electrodes described in 250.52(A)(5), (A)(7), and (A)(8). Steam, hot water pipes, or lightning protection system conductors shall not be employed as grounding electrodes for bonding conductors or grounding electrode conductors.~~

~~**(C) Electrode Connection.** Connections to grounding electrodes shall comply with 250.70.~~

~~**(D) Bonding of Electrodes.** A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the community antenna television system's grounding electrode and the power grounding electrode system at the building or structure served where separate electrodes are used.~~

~~*Exception: At mobile homes as covered in 820.106.*~~

~~Informational Note No. 1: See 250.60 for connection to a lightning protection system.~~

~~Informational Note No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.~~

(~~E~~B) Shield Protection Devices. Grounding of a coaxial drop cable shield by means of a protective device that does not interrupt the grounding system within the premises shall be permitted.

820.179 Coaxial Cables. Cables shall be listed in accordance with 820.179(A) through (D) and marked in accordance with Table 820.179. The cable voltage rating shall not be marked on the cable. ~~Coaxial cables shall have a temperature rating of not less than 60°C (140°F). The temperature rating shall be marked on the jacket of coaxial cables that have a temperature rating exceeding 60°C (140°F).~~

Informational Note: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

(A) Type CATVP. Type CATVP community antenna television plenum coaxial cables shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low-smoke-producing characteristics.

Informational Note: One method of defining a cable that is low-smoke-producing cable and fire-resistant cable is that the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-2015, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*.

(B) Type CATVR. Type CATVR community antenna television riser coaxial cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2012, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*.

(C) Type CATV. Type CATV community antenna television coaxial cables shall be listed as being suitable for general-purpose CATV use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Tray Flame Test" in ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

(D) Type CATVX. Type CATVX limited-use community antenna television coaxial cables shall be listed as being suitable for use in dwellings and for use in raceways and shall also be listed as being resistant to flame spread.

Informational Note: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2017, *Reference Standard for Electrical Wires, Cables and Flexible Cords*.

Table 820.179 Coaxial Cable Markings

Cable Marking	Type
CATVP	CATV plenum cable
CATVR	CATV riser cable
CATV	CATV cable
CATVX	CATV cable, limited use

Informational Note: Cable types are listed in descending order of fire performance.

~~**820.180 Grounding Devices.** Where bonding or grounding is required, devices used to connect a shield, a sheath, or non-current-carrying metallic members of a cable to a bonding conductor, or grounding electrode conductor, shall be listed or be part of listed equipment.~~

Article 830

Network-Powered Broadband Communications Systems

830.2 Definitions. See Part I of Article 100 and 890.2. The definitions in this section shall apply only within Article 830.

Informational Note: A typical single-family network-powered communications circuit consists of a communications drop or communications service cable and an NIU and includes the communications utility's serving terminal or tap where it is not under the exclusive control of the communications utility.

Abandoned Network-Powered Broadband Communications Cable. Installed network-powered broadband communications cable that is not terminated at equipment other than a connector and not identified for future use with a tag.

Block. A square or portion of a city, town, or village enclosed by streets, including the alleys so enclosed but not any street.

~~**Exposed (to Accidental Contact).** A circuit in such a position that, in case of failure of supports or insulation, contact with another circuit may result.~~

~~Informational Note: See Part I of Article 100 for two other definitions of *Exposed*: Exposed (as applied to live parts) and Exposed (as applied to wiring methods).~~

Fault Protection Device. An electronic device that is intended for the protection of personnel and functions under fault conditions, such as network-powered broadband communications cable short or open circuit, to limit the current or voltage, or both, for a low-power network-powered broadband communications circuit and provide acceptable protection from electric shock.

Network Interface Unit (NIU). A device that converts a broadband signal into component voice, audio, video, data, and interactive services signals and provides isolation between the network power and the premises signal circuits. These devices often contain primary and secondary protectors.

Network-Powered Broadband Communications Circuit. The circuit extending from the communications utility's or service provider's serving terminal or tap up to and including the NIU.

Informational Note: A typical one-family dwelling network-powered communications circuit consists of a communications drop or communications service cable and an NIU and includes the communications utility's serving terminal or tap where it is not under the exclusive control of the communications utility.

Point of Entrance. The point within a building at which the network-powered broadband communications cable emerges from an external wall, from a concrete floor slab, from rigid metal conduit (RMC), or from intermediate metal conduit (IMC).

830.3 Other Articles. Circuits and equipment shall comply with 830.3(A) through (~~G~~C). Only those sections of Chapters 1 through 7 referenced in Article 830 shall apply to communications circuits and equipment.

(A) General Requirements. The general requirements of Article 890 shall apply.

~~**(A) Hazardous (Classified) Locations.** Network-powered broadband communications circuits and equipment installed in a location that is classified in accordance with 500.5 and 505.5 shall comply with the applicable requirements of Chapter 5.~~

~~**(B) Wiring in Ducts for Dust, Loose Stock, or Vapor Removal.** The requirements of 300.22(A) shall apply.~~

~~**(C) Equipment in Other Space Used for Environmental Air.** The requirements of 300.22(C)(3) shall apply.~~

~~**(D) Installation and Use.** The requirements of 110.3(B) shall apply.~~

(~~E~~B) Output Circuits. As appropriate for the services provided, the output circuits derived from the network interface unit shall comply with the requirements of the following:

(1) Installations of communications circuits — Part V of Article 800

(2) Installations of community antenna television and radio distribution circuits — Part V of Article 820

Exception: Where protection is provided in the output of the NIU 830.90(B)(3) shall apply.

(3) Installations of optical fiber cables — Part V of Article 770

(4) Installations of Class 2 and Class 3 circuits — Part III of Article 725

(5) Installations of power-limited fire alarm circuits — Part III of Article 760

(~~F~~C) Protection Against Physical Damage. The requirements of 300.4 shall apply.

~~**830.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.** Access to electrical equipment shall not be denied by an accumulation of network-powered broadband communications cables that prevents removal of panels, including suspended ceiling panels.~~

830.24 Mechanical Execution of Work. ~~Network-powered broadband communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable.~~ The installation shall also conform to 300.4(A), (D), (E), (F), and 300.11. ~~Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).~~

~~Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA-568.1-D-2015, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards.~~

~~Informational Note No. 2: See NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).~~

~~Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of network-powered broadband cable properties.~~

~~**830.25 Abandoned Cables.** The accessible portion of abandoned network-powered broadband cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.~~

~~**830.26 Spread of Fire or Products of Combustion.** Installations of network-powered broadband cables in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations of network-powered broadband cables through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.~~

~~Informational Note: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire resistance–rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on~~

~~opposite sides of the wall. Assistance in complying with 830.26 can be found in building codes, fire resistance directories, and product listings.~~

~~**830.27 Temperature Limitations of Wires and Cables.** No wire or cable shall be used in such a manner that that its operating temperature exceeds that of its rating.~~

830.44 Overhead (Aerial) Cables. Overhead (aerial) network-powered broadband communications cables shall comply with 890.44(A) and 830.44(A) through (G).

Informational Note: For additional information regarding overhead (aerial) wires and cables, see ANSI C2-2007, *National Electrical Safety Code*, Part 2, Safety Rules for Overhead Lines.

(A) On Poles and In-Span. Where network-powered broadband communications cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 830.44(A)(1) ~~through (A)(4)~~ shall be met.

~~**(1) Relative Location.** Where practicable, the network-powered broadband communications cables shall be located below the electric light or power conductors.~~

~~**(2) Attachment to Cross-Arms.** Network-powered broadband communications cables shall not be attached to a cross-arm that carries electric light or power conductors.~~

~~**(3) Climbing Space.** The climbing space through network-powered broadband communications wires and cables shall comply with the requirements of 225.14(D).~~

(41) Clearance. Lead-in or overhead (aerial)-drop network-powered broadband communications cables from a pole or other support, including the point of initial attachment to a building or structure, shall be kept away from electric light, power, Class 1, or non–power-limited fire alarm circuit conductors so as to avoid the possibility of accidental contact.

Exception: Where proximity to electric light, power, Class 1, or non–power-limited fire alarm circuit conductors cannot be avoided, the installation shall provide clearances of not less than 300 mm (12 in.) from electric light, power, Class 1, or non–power-limited fire alarm circuit conductors. The clearance requirement shall apply to all points along the drop, and it shall increase to 1.02 m (40 in.) at the pole.

(B) Above Roofs. Network-powered broadband communications cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: Network-powered broadband communications cables shall not be required to have a vertical clearance of 2.5 m (8 ft) above auxillary buildings such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if (1) not more than 1.2 m (4 ft) of the broadband communications drop cables pass above the roof overhang, and (2) they are terminated at a through-the-roof raceway or support.

Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

(C) Clearance from Ground. Overhead (aerial) spans of network-powered broadband communications cables shall conform to not less than the following:

(1) 2.9 m (9**1⁄2** ft) — above finished grade, sidewalks, or from any platform or projection from which they might be reached and accessible to pedestrians only

(2) 3.5 m (11**1⁄2** ft) — over residential property and driveways, and those commercial areas not subject to truck traffic

(3) 4.7 m (15**1⁄2** ft) — over public streets, alleys, roads, parking areas subject to truck traffic, driveways on other than residential property, and other land traversed by vehicles such as cultivated, grazing, forest, and orchard

Informational Note: These clearances have been specifically chosen to correlate with ANSI/IEEE C2-2012, *National Electrical Safety Code*, Table 232-1, which provides for clearances of wires, conductors, and cables above ground and roadways, rather

than using the clearances referenced in 225.18. Because Article 800 and Article 820 have had no required clearances, the communications industry has used the clearances from the NESC for their installed cable plant.

(D) Over Pools. Clearance of network-powered broadband communications cable in any direction from the water level, edge of pool, base of diving platform, or anchored raft shall comply with those clearances in 680.9.

(E) Final Spans. Final spans of network-powered broadband communications cables without an outer jacket shall be permitted to be attached to the building, but they shall be kept not less than 900 mm (3 ft) from windows that are designed to be opened, doors, porches, balconies, ladders, stairs, fire escapes, or similar locations.

Exception: Conductors run above the top level of a window shall be permitted to be less than the 900-mm (3-ft) requirement above.

Overhead (aerial) network-powered broadband communications cables shall not be installed beneath openings through which materials might be moved, such as openings in farm and commercial buildings, and shall not be installed where they obstruct entrance to these building openings.

(F) Between Buildings. Network-powered broadband communications cables extending between buildings or structures, and also the supports or attachment fixtures, shall be identified as suitable for outdoor aerial applications and shall have sufficient strength to withstand the loads to which they may be subjected.

Exception: Where a network-powered broadband communications cable does not have sufficient strength to be self-supporting, it shall be attached to a supporting messenger cable that, together with the attachment fixtures or supports, shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

(G) On Buildings. Where attached to buildings, network-powered broadband communications cables shall be securely fastened in such a manner that they are separated from other conductors in accordance with 830.44(G)(1)through (G)(4).

(1) Electric Light or Power. The network-powered broadband communications cable shall have a separation of at least 100 mm (4 in.) from electric light, power, Class 1, or non–power-limited fire alarm circuit conductors not in raceway or cable, or be permanently separated from conductors of the other system by a continuous and firmly fixed nonconductor in addition to the insulation on the wires.

(2) Other Communications Systems. Network-powered broadband communications cables shall be installed so that there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the conductors, cables, messenger strand, or equipment of one system cause abrasion to the conductors, cables, messenger strand, or equipment of any other system.

(3) Lightning Conductors. Where practicable, a separation of at least 1.8 m (6 ft) shall be maintained between any network-powered broadband communications cable and lightning conductors.

Informational Note: Specific separation distances may be calculated from the sideflash formula found in NFPA 780-2014, *Standard for the Installation of Lightning Protection Systems*, Section 4.6.

(4) Protection from Damage. Network-powered broadband communications cables attached to buildings or structures and located within 2.5 m (8 ft) of finished grade shall be protected by enclosures, raceways, or other approved means.

Exception: A low-power network-powered broadband communications circuit that is equipped with a listed fault protection device, appropriate to the network-powered broadband communications cable used, and located on the network side of the network-powered broadband communications cable shall not be required to be additionally protected by enclosures, raceways, or other approved means.

830.48 Unlisted Cables Entering Buildings. Unlisted network-powered broadband communications cables shall not be permitted.

~~**830.49 Metal Entrance Conduit Grounding.** Metal conduit containing network-powered broadband communications entrance cable shall be connected by a bonding conductor or grounding electrode conductor to the building grounding electrode system in accordance with 830.100(B).~~

830.100 Cable, Network Interface Unit, and Primary Protector Bonding and Grounding. Network interface units containing protectors, NIUs with metallic enclosures, primary protectors, and the metallic members of the network-powered broadband communications cable that are intended to be bonded or grounded shall be connected as specified in 890.100(A) and 830.100(A) ~~through 830.100(D)~~.

(A) Bonding Conductor or Grounding Electrode Conductor.

~~**(1) Insulation.** The bonding conductor or grounding electrode conductor shall be listed and shall be permitted to be insulated, covered, or bare.~~

~~**(2) Material.** The bonding conductor or grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.~~

(~~3~~1) Size. The bonding conductor or grounding electrode conductor shall ~~not be smaller than 14 AWG and shall~~ have a current-carrying capacity not less than that of the grounded metallic member(s) and protected conductor(s) of the network-powered broadband communications cable. ~~The bonding conductor or grounding electrode conductor shall not be required to exceed 6 AWG.~~

~~**(4) Length.** The bonding conductor or grounding electrode conductor shall be as short as practicable. In one- and two-family dwellings, the bonding conductor or grounding electrode conductor shall be as short as practicable, not to exceed 6.0 m (20 ft) in length.~~

~~Informational Note: Similar bonding conductor or grounding electrode conductor length limitations applied at apartment buildings and commercial buildings help to reduce voltages that may be developed between the building's power and communications systems during lightning events.~~

~~*Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum bonding conductor or grounding electrode conductor length of 6.0 m (20 ft), a separate communications ground rod meeting the minimum dimensional criteria of 830.100(B)(3)(2) shall be driven, and the grounding electrode conductor shall be connected to the communications ground rod in accordance with 830.100(C). The communications ground rod shall be bonded to the power grounding electrode system in accordance with 830.100(D).*~~

~~**(5) Run in Straight Line.** The bonding conductor or grounding electrode conductor shall be run in as straight a line as practicable.~~

~~**(6) Physical Protection.** Bonding conductors and grounding electrode conductors shall be protected where exposed to physical damage. Where the bonding conductor or grounding electrode conductor is installed in a metal raceway, both ends of the raceway shall be bonded to the contained conductor or to the same terminal or electrode to which the bonding conductor or grounding electrode conductor is connected.~~

~~**(B) Electrode.** The bonding conductor or grounding electrode conductor shall be connected in accordance with 830.100(B)(1), 830.100(B)(2), or 830.100(B)(3).~~

~~**(1) In Buildings or Structures with an Intersystem Bonding Termination.** If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.~~

~~Informational Note: See informational note following 800.100(B)(1) for an illustration of the application of the bonding conductor in buildings and structures equipped with an intersystem bonding termination.~~

~~**(2) In Buildings or Structures with Grounding Means.** If an intersystem bonding termination is established, 250.94(A) shall apply.~~

~~If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:~~

~~(1) The building or structure grounding electrode system as covered in 250.50~~

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible metal power service raceway

(5) The service equipment enclosure

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is connected to an electrode as covered in 250.32

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.

Informational Note: See informational note following 800.100(B)(1) for an illustration of the application of the bonding conductor in buildings and structures not equipped with an intersystem bonding termination or terminating block providing access to the building grounding electrode system.

For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 830.93, shall be considered accessible.

(3) In Buildings or Structures Without an Intersystem Bonding Termination or Grounding Means. If the building or structure served has no intersystem bonding termination or grounding means, as described in 830.100(B)(2), the grounding electrode conductor shall be connected to either of the following:

(1) To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or (A)(4).

(2) If the building or structure served has no intersystem bonding termination or has no grounding means, as described in 830.100(B)(2) or (B)(3)(1), to any one of the individual grounding electrodes described in 250.52(A)(7) and (A)(8), or to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (**1/2** in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning conductors as covered in 800.53 and at least 1.8 m (6 ft) from electrodes of other systems. Steam, hot water pipes, or lightning-protection system conductors shall not be employed as grounding electrodes for protectors, NIUs with integral protection, grounded metal members, NIUs with metallic enclosures, and other equipment.

(C) Electrode Connection. Connections to grounding electrodes shall comply with 250.70.

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the network-powered broadband communications system grounding electrode and the power grounding electrode system at the building or structure served where separate electrodes are used.

Exception: At mobile homes as covered in 830.106.

Informational Note No. 1: See 250.60 for use of a connection to a lightning protection system.

Informational Note No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.

830.179 Network-Powered Broadband Communications Equipment and Cables. Network-powered broadband communications equipment and cables shall be listed and marked in accordance with 830.179(A) or (B). Network-powered broadband communications cables shall have a temperature rating of not less than 60°C (140°F). The temperature rating shall be marked on the jacket of network-powered broadband communications cables that have a temperature rating exceeding 60°C (140°F).

Exception No. 1: This listing requirement shall not apply to community antenna television and radio distribution system coaxial cables that were installed prior to January 1, 2000, in accordance with Article 820 and are used for low-power network-powered broadband communications circuits.

Exception No. 2: Substitute cables for network-powered broadband communications cables shall be permitted as shown in Table 830.154(b).

(A) Network-Powered Broadband Communications Medium-Power Cables. Network-powered broadband communications medium-power cables shall be factory-assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.120.

(1) Type BMR. Type BMR cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2011, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*.

(2) Type BM. Type BM cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the UL Flame Exposure, Vertical Tray Flame Test in ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

(3) Type BMU. Type BMU cables shall be jacketed and listed as being suitable for outdoor underground use.

(B) Network-Powered Broadband Communication Low-Power Cables. Network-powered broadband communications low-power cables shall be factory-assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.120.

(1) Type BLP. Type BLP cables shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low-smoke producing characteristics.

Informational Note: One method of defining a cable that is low-smoke producing cable and fire-resistant cable is that the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-2015, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*.

(2) Type BLR. Type BLR cables shall be listed as being suitable for use in a vertical run in a shaft, or from floor to floor, and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2011, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*.

(3) Type BL. Type BL cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.

Informational Note: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the UL Flame Exposure, Vertical Tray Flame Test in ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-09, *Test Methods for Electrical Wires and Cables*.

(4) Type BLX. Type BLX limited-use cables shall be listed as being suitable for use outside, for use in dwellings, and for use in raceways and shall also be listed as being resistant to flame spread.

Informational Note: One method of determining that cable is resistant to flame spread is by testing the cable to VW-1 (vertical-wire) flame test in ANSI/UL 1581-2011, *Reference Standard for Electrical Wires, Cables and Flexible Cords*.

(5) Type BLU. Type BLU cables shall be jacketed and listed as being suitable for outdoor underground use.

~~**830.180 Grounding Devices.** Where bonding or grounding is required, devices used to connect a shield, a sheath, or non-current-carrying metallic members of a cable to a bonding conductor, or grounding electrode conductor, shall be listed or be part of listed equipment.~~

Article 840

Premises-Powered Broadband Communications Systems

840.2 Definitions. The definitions in Part I of Article 100, 770.2, 800.2, ~~and~~ 820.2, and 890.2 shall apply. The definitions in this section shall apply only within Article 840.

Broadband. Wide bandwidth data transmission which transports multiple signals, protocols, and traffic types over various media types.

Communications Service Provider. An organization, business, or individual that offers communications service to others.

Network Terminal. A device that converts network-provided signals (optical, electrical, or wireless) into component signals, including voice, audio, video, data, wireless, optical, and interactive services, and is considered a network device on the premises that is connected to a communications service provider and is powered at the premises.

Premises Communications Circuit. The circuit that extends voice, audio, video, data, interactive services, telegraph (except radio), and outside wiring for fire alarm and burglar alarm from the service provider's network terminal to the customer's communications equipment up to and including terminal equipment, such as a telephone, a fax machine, or an answering machine.

Premises Community Antenna Television (CATV) Circuit. The circuit that extends community antenna television (CATV) systems for audio, video, data, and interactive services from the service provider's network terminal to the appropriate customer equipment.

Premises-Powered. Using power provided locally from the premises.

840.3 Other Articles. Circuits and equipment shall comply with 840.3(A) through (~~G~~C). Only those sections of Chapters 1 through 7 referenced in Article 840 shall apply to premises-powered broadband communications systems.

(A) General Requirements. The general requirements of Article 890 shall apply.

~~**(A) Hazardous (Classified) Locations.** Premises-powered broadband communications circuits and equipment installed in a location that is classified in accordance with 500.5 and 505.5 shall comply with the applicable requirements of Chapter 5.~~

~~**(B) Cables in Ducts for Dust, Loose Stock, or Vapor Removal.** The requirements of 300.22(A), 770.3(B), 800.3(B), and 820.3(B) shall apply.~~

~~**(C) Equipment in Other Space Used for Environmental Air.** The requirements of 300.22(C)(3) shall apply.~~

~~**(D) Installation and Use.** The requirements of 110.3(B) shall apply.~~

(~~E~~B) Output Circuits. As appropriate for the services provided, the output circuits derived from the network terminal shall comply with the requirements of the following:

(1) Installations of communications circuits — Part V of Article 800

(2) Installations of premises (within buildings) community antenna television and radio distribution circuits — Part V of Article 820

(3) Installations of optical fiber cables — Part V of Article 770

(4) Installations of Class 2 and Class 3 circuits — Part III of Article 725

Informational Note: See 725.121 for information on the classification of information technology equipment circuits.

(5) Installations of power-limited fire alarm circuits — Part III of Article 760

~~**(F) Other Communications Systems.** As appropriate for the system involved, traditional communications systems shall comply with the requirements of the following:~~

~~(1) Communications Circuits — Article 800~~

~~(2) Radio and Television Equipment — Article 810~~

~~(3) Community Antenna Television and Radio Distribution Systems — Article 820~~

~~(4) Network-Powered Broadband Communications Systems — Article 830~~

(~~G~~C) Electrical Classification of Data Circuits and Cables. Sections 725.139(D)(1) and 800.133(A)(1)(b) shall apply to the electrical classification of Class 2 and Class 3 circuits in the same cable with communications circuits.

~~**840.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.** Access to electrical equipment shall not be denied by an accumulation of premises-powered broadband cables that prevents removal of panels, including suspended ceiling panels.~~

840.24 Mechanical Execution of Work. The requirements of 770.24~~, 800.24,~~ and ~~820.24~~890.24 shall apply.

~~**840.25 Abandoned Cables.** The requirements of 770.25, 800.25, and 820.25 shall apply.~~

~~**840.26 Spread of Fire or Products of Combustion.** The requirements of 770.26, 800.26, and 820.26 shall apply.~~

~~**840.27 Temperature Limitations of Wires and Cables.** No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.~~

840.44 Overhead (Aerial) Optical Fiber Cables. Overhead (aerial) optical fiber cables containing a non–current-carrying metallic member entering buildings shall comply with 770.44(A) and (B).

840.48 Unlisted Wires and Cables Entering Buildings. Installations of unlisted cables entering buildings shall comply with 890.48 and 840.48(A), (B), or (C), as applicable.

(A) Optical Fiber Cables. Installations of unlisted optical fiber cables entering buildings shall comply with 770.48.

(B) Communications Wires and Cables. Installations of unlisted communications wires and unlisted multipair communications cables entering buildings shall comply with 800.48.

(C) Coaxial Cables. Installations of unlisted coaxial cables entering buildings shall comply with 820.48.

~~**840.49 Metallic Entrance Conduit Grounding.** The requirements of 770.49, 800.49, and 820.49 shall apply, as applicable.~~

840.100 Network Terminal and Cable Grounding. Grounding required for protection of the network terminal, conductive optical fiber cables, multipair communications cables, antenna lead-in conductors, and coaxial cables shall comply with 890.100 and 770.100, 800.100, 810.21, or 820.100, as applicable.

~~**840.180 Grounding Devices.** Where bonding or grounding is required, devices used to connect a shield, a sheath, or non–current-carrying metallic members of a cable to a bonding conductor, or grounding electrode conductor, shall be listed or be part of listed equipment.~~

Global FR-7512 New Article 890 Panel 16

Article 890 General Requirements for Communications Systems

Part I. General

890.1 Scope

This article covers communications circuits, community antenna television and radio distribution systems, network-powered broadband communications systems, and premises-powered broadband communications systems, in addition to the specific requirements in Articles 800, 820, 830, and 840.

Informational Note No. 1: See 90.2(B)(4) for installations of circuits and equipment that are not covered.

Informational Note No. 2: For further information for remote control, signaling, and power-limited circuits, see Article 725.

Informational Note No. 3: For further information for fire alarm systems, see Article 760.

890.2 Definitions.

See Part I of Article 100. The definitions in 890.2 shall apply only within Articles 800, 820, 830, and 840.

Abandoned Cable.

Installed cable that is not terminated as described in 800.2 for communications cable, 820.2 for CATV coaxial cable, or 830.2 for network-powered broadband communications cable and that is not identified for future use with a tag.

Communications Service Provider.

An organization, business, or individual that offers communications service to others.

Exposed (to Accidental Contact).

A circuit in such a position that, in case of failure of supports or insulation, contact with another circuit may result.

Informational Note: See Part I of Article 100 for two other definitions of Exposed: *Exposed (as applied to live parts)* and *Exposed (as applied to wiring methods)*.

Point of Entrance.

The point within a building at which the wire or cable emerges from an external wall or from a concrete floor slab. See 830.2 for additional provisions pertaining to Article 830.

Premises.

The land and buildings of a user located on the user side of the utility-user network point of demarcation.

890.3 Other Articles.

Only those sections of Chapters 1 through 7 referenced in Chapter 8 shall apply to Chapter 8.

(A) Hazardous (Classified) Locations.

Circuits and equipment installed in a location that is classified in accordance with 500.5 and 505.5 shall comply with the applicable requirements of Chapter 5.

(B) Wiring in Ducts for Dust, Loose Stock, or Vapor Removal.

The requirements of 300.22(A) shall apply.

(C) Equipment in Other Space Used for Environmental Air.

The requirements of 300.22(C)(3) shall apply.

(D) Installation and Use.

The requirements of 110.3(B) shall apply.

(E) Other Communications Systems.

As appropriate for the system involved, communications systems shall comply with the requirements of the following:

(1) Communications circuits — Article 800

(2) Radio and television equipment — Article 810

(3) Community antenna television and radio distribution systems — Article 820

(4) Network-powered broadband communications systems — Article 830

(5) Premises-powered broadband communications systems — Article 840

890.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.

Access to electrical equipment shall not be denied by an accumulation of wires and cables that prevents removal of panels, including suspended ceiling panels.

890.24 Mechanical Execution of Work.

Circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also

conform to 300.4(D) and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C). See 830.24 and 840.24 for additional provisions pertaining to Articles 830 and 840.

Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling;* ANSI/TIA-568.1- D-2015, *Commercial Building Telecommunications Infrastructure Standard;* ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces;* ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard;* ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises;* ANSI/ TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard;* ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities;* and other ANSI-approved installation standards.

Informational Note No. 2: See NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of wire and cable properties.

890.25 Abandoned Cables.

The accessible portion of abandoned cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

890.26 Spread of Fire or Products of Combustion.

Installations of cables, communications raceways, cable routing assemblies in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations of cables, communications raceways, and cable routing assemblies through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.

Informational Note: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire resistance–rated wall assembly. An example is the 600 mm (24 in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 890.26 can be found in building codes, fire resistance directories, and product listings.

890.27 Temperature Limitation of Wires and Cables.

No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.

Part II. Wires and Cables Outside and Entering Buildings

890.44 Overhead (Aerial) Wires and Cables.

Overhead (aerial) wires and cables entering buildings shall comply with 890.44(A) and 800.44 for communications cable, 820.44 for CATV coaxial cable, 830.44 for network-powered broadband communications cable, and 840.44 for premises-powered broadband communications systems.

(A) On Poles and In-Span.

Where wires and cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 890.44(A)(1) through (A)(3) shall be met.

(1) Relative Location.

Where practicable, the wires and cables shall be located below the electric light or power conductors.

(2) Attachment to Cross-Arms.

Wires and cables shall not be attached to a cross-arm that carries electric light or power conductors.

(3) Climbing Space.

The climbing space through wires and cables shall comply with the requirements of 225.14(D).

890.48 Unlisted Cables Entering Buildings.

Unlisted outside plant cables shall be permitted to be installed in building spaces other than risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air, where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated as specified in 800.48 for communications cable and 820.48 for CATV coaxial cable as applicable. The point of entrance shall be permitted to be extended from the penetration of the external wall or floor slab by continuously enclosing the entrance cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.

890.49 Metal Entrance Conduit Grounding.

Metal conduit containing entrance wire or cable shall be connected by a bonding conductor or grounding electrode conductor to the grounding electrode or the building grounding electrode system in accordance with 890.100(B).

Part III. Protection

890.80 Protection.

Protection of communications systems shall comply with Article 800, Part III for communications circuits, Article 820, Part III for community antenna television and radio distribution systems, Article 830, Part III for network-

powered broadband communications systems, or Article 840, Part III for premises-powered broadband communications systems.

Part IV. Grounding Methods

890.100 Cable and Primary Protector Bonding and Grounding.

(A) Bonding Conductor or Grounding Electrode Conductor.

(1) Insulation.

The bonding conductor or grounding electrode conductor shall be listed and shall be permitted to be insulated, covered, or bare.

(2) Material.

The bonding conductor or grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.

(3) Size.

The bonding conductor or grounding electrode conductor shall not be smaller than 14 AWG. The bonding conductor or grounding electrode conductor shall not be required to exceed 6 AWG.

(4) Length.

The bonding conductor or grounding electrode conductor shall be as short as practicable. In one- and two-family dwellings, the bonding conductor or grounding electrode conductor shall be as short as practicable, not to exceed 6.0 m (20 ft) in length.

Informational Note: Similar bonding conductor or grounding electrode conductor length limitations applied at apartment buildings and commercial buildings help to reduce voltages that may be developed between the building's power and communications systems during lightning events.

Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum bonding conductor or grounding electrode conductor length of 6.0 m (20 ft), a separate ground rod meeting the minimum dimensional criteria of 890.100(B)(3)(2) or (B)(3)(3) shall be driven, the bonding conductor or grounding electrode conductor shall be connected to the ground rod in accordance with 890.100(C), and the ground rod shall be connected to the power grounding electrode system in accordance with 890.100(D).

(5) Run in Straight Line.

The bonding conductor or grounding electrode conductor shall be run in as straight a line as practicable.

(6) Physical Protection.

Bonding conductors and grounding electrode conductors shall be protected where exposed to physical damage. Where the bonding conductor or grounding electrode conductor is installed in a metal raceway, both ends of the raceway shall be bonded to the contained conductor or to the same terminal or electrode to which the bonding conductor or grounding electrode conductor is connected.

(B) Electrode.

The bonding conductor or grounding electrode conductor shall be connected in accordance with 890.100(B)(1), (B)(2) , or (B)(3).

(1) In Buildings or Structures with an Intersystem Bonding Termination.

If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.

(2) In Buildings or Structures with Grounding Means.

If an intersystem bonding termination is established, 250.94(A) shall apply. If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible metal power service raceway

(5) The service equipment enclosure

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is connected to a grounding electrode as covered in 250.32

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on non-removable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is non-removable.

(3) In Buildings or Structures Without an Intersystem Bonding Termination or Grounding Means.

If the building or structure served has no intersystem bonding termination or grounding means, as described in 890.100(B)(2), the grounding electrode conductor shall be connected to one of the following:

(1) To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or (A)(4)

(2) If the building or structure served has no intersystem bonding termination or grounding means, as described in 890.100(B)(2) or (B)(3)(1), to any one of the individual grounding electrodes described in 250.52(A)(5), (A)(7), and (A)(8)

(3) For communications circuits or network-powered broadband communications systems, to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (0.5 in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning protection system conductors, as covered in 800.53, and at least 1.8 m (6 ft) from electrodes of other systems

Steam, hot water pipes, or lightning protection system conductors shall not be employed as grounding electrodes for bonding conductors or grounding electrode conductors.

(C) Electrode Connection.

Connections to grounding electrodes shall comply with 250.70.

(D) Bonding of Electrodes.

A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used.

Informational Note No. 1: See 250.60 for connection to a lightning protection system.

Informational Note No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.

Part V. Installation Methods Within Buildings

890.179 Wires and Cables.

Wires and cables shall be listed in accordance with 800.179, 820.179, 830.179, or 840.170 as applicable. Wires and cables shall have a temperature rating of not less than 60°C (140°F). The temperature rating shall be marked on the jacket of cables that have a temperature rating exceeding 60°C (140°F).

Part VI. Listing Requirements

890.180 Grounding Devices.

Where bonding or grounding is required, devices used to connect a shield, a sheath, or non-current-carrying metallic members of a cable to a bonding conductor or grounding electrode conductor shall be listed or be part of listed equipment.

First Revision No. 7530-NFPA 70-2018 [Global Input]

Delete the Informational Note at the beginning of Article 770.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:16:37 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The informational note is deleted to eliminate a "floating" informational note, one that is not directly associated with a requirement. This information note is replaced by informational notes in Sections 770.100(B)(1) and 770.100(B)(2) to closely associate the information with the requirements to which it pertains.

Response Message:

Public Input No. 2064-NFPA 70-2017 [Article 770 [Excluding any Sub-Sections]]

Public Input No. 903-NFPA 70-2017 [Article 770 [Excluding any Sub-Sections]]

First Revision No. 8042-NFPA 70-2018 [Global Input]

Update the following references:

(a) In 800.179(E), 800.179(F), 820.179(D), and 830.179(B)(4), update UL 1581 to "-2017".

(b) In 800.182(A), update ASTM E84 to "-17a".

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 12 07:23:37 EST 2018

Committee Statement and Meeting Notes

Committee Statement: References to UL 1581 and ASTM E84 are updated to the current editions.
Response Message:

First Revision No. 8117-NFPA 70-2018 [Global Input]

Do not add a definition of "Nominal Current" to 840.2.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 13 01:25:41 EST 2018

Committee Statement and Meeting Notes

Committee Statement: In accordance with Section 5.10 of the Regulations Governing the Development of NFPA Standards, Tentative Interim Amendments (TIA) issued after the Public Input closing date shall also apply, when the text of the existing NFPA Standard remains unchanged, to the next edition of the NFPA Standard.

Under this rule, TIA 70-17-12, which added a new definition for "nominal current" to 840.2 and revised 840.160 in a manner that used this term, will apply to the 2020 edition unless the Panel enacts revisions on the affected text. Since 840.160 has been revised (First Revision No. 7892), that portion of the TIA will NOT apply to the 2020 edition. As the term "nominal current" is not used in the revised 840.160, the definition is not needed. In order to ensure that TIA 70-17-12 is not applied to the next edition of the Code in accordance with the Regulations, this revision establishes the Panel's intent that the definition of "nominal current" from TIA 70-17-12 is not applicable to the 2020 edition of the NEC.

Response Message:

Public Input No. 1019-NFPA 70-2017 [Definition: Network Terminal.]

First Revision No. 7535-NFPA 70-2018 [Detail]

[Revise the preamble text in 770.2 as follows.]

See Part I of Article 100. The definitions in this section shall apply only within Article 770. ~~For purposes of this article, the following additional definitions apply.~~

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:40:33 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The revised text clarifies the applicability of the definitions contained in 770.2, as recommended by the NEC Correlating Committee Task Group.

Response Message:

Public Input No. 1972-NFPA 70-2017 [Section No. 770.2]

First Revision No. 7581-NFPA 70-2018 [Detail]

IN 770.24, REVISE THE FOLLOWING SENTENCE AS SHOWN:

The installation shall also conform to 300.4~~(D) through (G)~~ and 300.11.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 16:23:47 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The cross-reference to 300.4(D) through (G) is updated to 300.4 to reflect the original intent of the Panel to reference the entire section.
Response Message:

First Revision No. 7584-NFPA 70-2018 [Detail]

Add the following Informational Note to 770.100(B)(1):

Informational Note: See Informational Note following 800.100(B)(1) for an illustration of the application of the bonding conductor in buildings or structures equipped with an intersystem bonding termination.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 17:01:08 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The original location of this information (immediately following "Article 770") resulted in a "floating" informational note that was not directly associated with a specific requirement. Relocation to Section 770.100(B)(1) associates the informational note directly with the requirement to which it pertains.

Response Message:

Public Input No. 904-NFPA 70-2017 [Section No. 770.100(B)(1)]

First Revision No. 7597-NFPA 70-2018 [Detail]

Revise the title of 770.110:

770.110 Raceways, ~~and~~ Cable Routing Assemblies, and Cable Trays for Optical Fiber Cables.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 08:11:43 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Cable trays and cable routing assemblies perform similar functions. The code becomes more user-friendly if they are covered in the same section.

Response Message:

Public Input No. 79-NFPA 70-2017 [Section No. 770.110]

First Revision No. 7644-NFPA 70-2018 [Detail]

Delete the Informational Note at the beginning of Article 800.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 11:21:16 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The current placement of Informational Note Figure 800(a) and Figure 800(b) results in a "floating" informational note that is not associated with a specific requirement. The text is relocated to the requirement with which they are directly associated.

Response Message:

Public Input No. 892-NFPA 70-2017 [Article 800 [Excluding any Sub-Sections]]

Public Input No. 1626-NFPA 70-2017 [Article 800 [Excluding any Sub-Sections]]

Public Input No. 893-NFPA 70-2017 [Article 800]

Public Input No. 3457-NFPA 70-2017 [Article 800]

First Revision No. 7665-NFPA 70-2018 [Detail]

Add new text to 800.3 as follows:

800.3 Other Articles.

Installations of communications circuits and equipment shall comply with 800.3(A) through (G). Only those sections of Chapters 1 through 7 referenced in Article 800 shall apply to communications circuits and equipment.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 13:35:09 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The new text is added to reinforce the independence of Article 800.
Response Message:

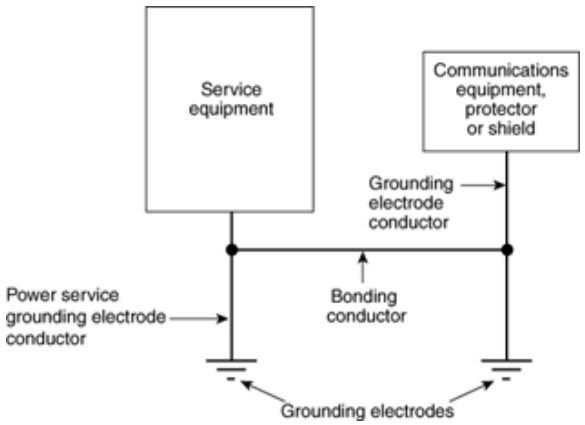
Public Input No. 1737-NFPA 70-2017 [Section No. 800.3]

First Revision No. 7717-NFPA 70-2018 [Detail]

Add an informational note and figure to 800.100(B)(2).

Informational Note: Informational Note Figure 800.100(B)(2) illustrates the connection of the bonding conductor in buildings or structures not equipped with an intersystem bonding termination or terminal block providing access to the building grounding means.

Figure Informational Note Figure 800.100(B)(2) Illustration of a Grounding Electrode Conductor in a Communications Installation.



Supplemental Information

File Name	Description	Approved
70_FR7717_800.100_B_2_InformationalNote.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 17:52:03 EST 2018

Committee Statement and Meeting Notes

Committee Statement: This new informational note, including the revised Figure 800(b) from Section 800.1, will closely associate the informational note with the requirement to which it pertains. The original placement created a "floating" informational note that is not directly associated with a specific requirement.

Response Message:

Public Input No. 895-NFPA 70-2017 [Section No. 800.100(B)(2)]

Editorial Comment

Click here

First Revision No. 7790-NFPA 70-2018 [Detail]

Revise x-ref in the first paragraph of 800.179, as follows:

800.179 Communications Wires and Cables.

Communications wires and cables shall be listed in accordance with 800.179(A) through (~~I~~ J) and marked in accordance with Table 800.179. Conductors in communications cables, other than in a coaxial cable, shall be copper.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 10:24:49 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The cross-reference is updated to reflect the addition of new 800.179(H).
Response Message:

First Revision No. 7881-NFPA 70-2018 [Detail]

Add a charging paragraph to 840.3, as follows:

Circuits and equipment shall comply with 840.3(A) through (G). Only those sections of Chapters 1 through 7 referenced in Article 840 shall apply to premises-powered broadband communications systems.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 17:14:29 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The cross-reference to 840.3(A) through (G) is added for consistency.

The second sentence is added to reinforce the independence of Article 840.

Response Message:

Public Input No. 1741-NFPA 70-2017 [Section No. 840.3]

First Revision No. 7929-NFPA 70-2018 [Detail]

Delete the Informational Note at the beginning of Article 810.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 10:34:43 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The additions, made during the 2014 code cycle, were an attempt to clarify the differences between grounding and bonding. The note has served its useful purpose and is no longer needed.

Response Message:

Public Input No. 1627-NFPA 70-2017 [Article 810 [Excluding any Sub-Sections]]

First Revision No. 7938-NFPA 70-2018 [Detail]

Delete the Informational Note at the beginning of Article 820.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:04:15 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The additions, made during the 2014 code cycle, were an attempt to clarify the differences between grounding and bonding. The note has served its useful purpose and is no longer needed.

Response Message:

Public Input No. 1628-NFPA 70-2017 [Article 820 [Excluding any Sub-Sections]]

First Revision No. 9005-NFPA 70-2018 [Detail]

Delete the Informational Note at the beginning of Article 830.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 30 14:27:09 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The current placement of the Informational Note results in a "floating" informational note that is not associated with a specific requirement. The text is relocated to the requirement with which it is directly associated.

Response Message:

Public Input No. 900-NFPA 70-2017 [Article 830 [Excluding any Sub-Sections]]

First Revision No. 7523-NFPA 70-2018 [Definition: Coaxial Cable.]

Cable, Coaxial ~~Cable~~ .

A cylindrical assembly composed of a conductor centered inside a metallic tube or shield, separated by a dielectric material, and usually covered by an insulating jacket. (CMP-16)

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:03:57 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The purpose of this FR and the other FR dealing with cable definitions is to group the definitions of the various cables together, just like the definitions of the various types of dwelling units are grouped together.

Response Message:

Public Input No. 145-NFPA 70-2017 [Definition: Coaxial Cable.]

First Revision No. 7524-NFPA 70-2018 [Definition: Communications Raceway.]

Raceway, Communications ~~Raceway~~ .

An enclosed channel of nonmetallic materials designed expressly for holding communications wires and cables; optical fiber cables; data cables associated with information technology and communications equipment; Class 2, Class 3, and Type PLTC cables; and power-limited fire alarm cables in plenum, riser, and general-purpose applications. (CMP-16)

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:05:49 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The purpose of this FR and the other FR dealing with cable definitions is to group the definitions of the various cables together, just like the definitions of the various types of dwelling units are grouped together.

Response Message:

Public Input No. 144-NFPA 70-2017 [Definition: Communications Raceway.]

First Revision No. 7525-NFPA 70-2018 [Definition: Composite Optical Fiber Cable.]

~~Composite~~ Cable, Optical Fiber ~~Cable~~ , Composite .

A cable containing optical fibers and current-carrying electrical conductors. (CMP-16)

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:07:39 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The purpose of this FR and the other FR dealing with cable definitions is to group the definitions of the various cables together, just like the definitions of the various types of dwelling units are grouped together.

Response Message:

Public Input No. 146-NFPA 70-2017 [Definition: Composite Optical Fiber Cable.]

First Revision No. 7526-NFPA 70-2018 [Definition: Conductive Optical Fiber Cable.]

~~Conductive~~ Cable, Optical Fiber ~~Cable~~ , Conductive .

A factory assembly of one or more optical fibers having an overall covering and containing non–current-carrying conductive member(s) such as metallic strength member(s), metallic vapor barrier(s), metallic armor, or metallic sheath. (CMP-16)

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:10:58 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The purpose of this FR and the other FR dealing with cable definitions is to group the definitions of the various cables together, just like the definitions of the various types of dwelling units are grouped together.

Response Message:

Public Input No. 147-NFPA 70-2017 [Definition: Conductive Optical Fiber Cable.]

Editorial Comment

Click here

First Revision No. 7528-NFPA 70-2018 [Definition: Nonconductive Optical Fiber Cable.]

~~**Nonconductive**~~ **Cable, Optical Fiber~~, Cable~~ , Nonconductive .**

A factory assembly of one or more optical fibers having an overall covering and containing no electrically conductive materials. (CMP-16)

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:12:26 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The purpose of this FR and the other FR dealing with cable definitions is to group the definitions of the various cables together, just like the definitions of the various types of dwelling units are grouped together.

Response Message:

Public Input No. 148-NFPA 70-2017 [Definition: Nonconductive Optical Fiber Cable.]

First Revision No. 7529-NFPA 70-2018 [Definition: Optical Fiber Cable.]

Cable, Optical Fiber ~~Cable~~ .

A factory assembly or field assembly of one or more optical fibers having an overall covering. (CMP-16)

Informational Note: A field-assembled optical fiber cable is an assembly of one or more optical fibers within a jacket. The jacket, without optical fibers, is installed in a manner similar to conduit or raceway. Once the jacket is installed, the optical fibers are inserted into the jacket, completing the cable assembly.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:13:41 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The purpose of this FR and the other FR dealing with cable definitions is to group the definitions of the various cables together, just like the definitions of the various types of dwelling units are grouped together.

Response Message:

Public Input No. 149-NFPA 70-2017 [Definition: Optical Fiber Cable.]

First Revision No. 7567-NFPA 70-2018 [Section No. 770.24]

Detail FR-7581

770.24 Mechanical Execution of Work.

Optical fiber cables shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform ~~with~~ to ~~300.4(D)~~ 300.4 ~~through (G)~~ and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 300.22(C).

Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/NECA/FOA 301-~~2009~~2016, *Standard for Installing and Testing Fiber Optic Cables*; ~~and other ANSI-approved installation standards.~~ ANSI/TIA-568.0-D-2015, *Generic Telecommunications Cabling for Customer Premises*, and ANSI/TIA 568.3-D-2016, *Optical Fiber Cabling and Components Standard*.

Informational Note No. 2: See ~~4.3.11.2.6.5 and 4.3.11.5.5.6 of~~ NFPA 90A-~~2012~~2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of optical fiber cable properties.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 15:40:40 EST 2018

Committee Statement and Meeting Notes

Committee Statement: This revision updates the issue date of references and adds new references.
Response Message:

Public Input No. 161-NFPA 70-2017 [Section No. 770.24]

Public Input No. 1857-NFPA 70-2017 [Section No. 770.24]

Public Input No. 1104-NFPA 70-2017 [Section No. 770.24]

Public Input No. 2567-NFPA 70-2017 [Section No. 770.24]

Editorial Comment

Click here

First Revision No. 7582-NFPA 70-2018 [Section No. 770.49]

770.49 ~~Metallic~~ Metal Entrance Conduit Grounding.

~~Metallic~~ Metal conduit containing optical fiber entrance cable shall be connected by a bonding conductor or grounding electrode conductor to a building grounding electrode system in accordance with 770.100(B).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 16:31:42 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The revisions dealing with grounding are consistent with usage throughout the Code.

Response Message:

Public Input No. 2921-NFPA 70-2017 [Section No. 770.49]

Public Input No. 2065-NFPA 70-2017 [Section No. 770.49]

First Revision No. 7583-NFPA 70-2018 [Section No. 770.93]

770.93 Grounding, Bonding, or Interruption of Non–Current-Carrying Metallic Members of Optical Fiber Cables.

Optical fiber cables entering the building or terminating on the outside of the building shall comply with 770.93(A) or (B).

(A) Entering Buildings.

In installations where an optical fiber cable is exposed to contact with electric light or power conductors and the cable enters the building, the non–current-carrying metallic members shall be either grounded or bonded as specified in 770.100 or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.

(B) Terminating on the Outside of Buildings.

In installations where an optical fiber cable is exposed to contact with electric light or power conductors and the cable is terminated on the outside of the building, the non–current-carrying metallic members shall be either grounded or bonded as specified in 770.100 or interrupted by an insulating joint or equivalent device. The grounding, bonding, or interruption shall be as close as practicable to the point of termination of the cable.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 16:48:45 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The addition of the terms "bonded" and "bonding" coordinates with the requirements of 770.100.

Response Message:

Public Input No. 2066-NFPA 70-2017 [Section No. 770.93]

Editorial Comment

Click here

First Revision No. 7585-NFPA 70-2018 [Section No. 770.100(B)]

(B) Electrode.

The bonding conductor and grounding electrode conductor shall be connected in accordance with 770.100(B)(1), (B)(2), or (B)(3).

Detail FR-7584

(1) In Buildings or Structures with an Intersystem Bonding Termination.

If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.

Informational Note: See Informational Note Figure 800.100(B)(1) for an illustration of the application of the bonding conductor in buildings or structures equipped with an intersystem bonding termination.

(2) In Buildings or Structures with Grounding Means.

If an intersystem bonding termination is established, 250.94(A) shall apply.

If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible ~~metallic~~ metal power service raceway

(5) The service equipment enclosure

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is ~~grounded~~ connected to ~~an~~ a grounding electrode as covered in 250.32

Informational Note: See Informational Note Figure 800.100(B)(2) for an illustration of the application of the bonding conductor in buildings or structures not equipped with an intersystem bonding termination or terminal block providing access to the building grounding electrode system.

(3) In Buildings or Structures Without Intersystem Bonding Termination or Grounding Means.

If the building or structure served has no intersystem bonding termination or grounding means, as described in 770.100(B)(2), the grounding electrode conductor shall be connected to either of the following:

(1) To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or (A)(4).

(2) If the building or structure served has no grounding means, as described in 770.100(B)(2) or (B)(3)(1), to any one of the individual grounding electrodes described in 250.52(A)(7) and (A)(8) or to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (½ in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning protection system conductors as covered in 800.53 and at least 1.8 m (6 ft) from electrodes of other systems. Steam, hot water pipes, or lightning protection system conductors shall not be employed as electrodes for non–current-carrying metallic members.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:

City:

State:

Zip:

Submittal Date: Mon Jan 08 17:08:13 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" is a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the propose of describing material used with raceways, gutters, etc. in the National Electrical Code.

This section does not align with the definition of the term Grounded (Grounding) as provided in Article 100. The revised text fixes the meaning of the text by changing the term “grounded” to the term “connected.” The word connected is more appropriate. The grounded electrode conductor or the grounding electrode are required to be connected to the electrode, not grounded to it.

The original location of the Informational Note (immediately following "Article 770") resulted in a "floating" informational note, one that is not directly associated with a specific requirement. Relocation to Section 770.100(B)(2) associates the informational note directly with the requirement to which it pertains.

Response Message:

Public Input No. 905-NFPA 70-2017 [Section No. 770.100(B)(2)]

Public Input No. 3338-NFPA 70-2017 [Section No. 770.100(B)(2)]

Public Input No. 2922-NFPA 70-2017 [Section No. 770.100(B)]

Editorial Comment

Click here

First Revision No. 7601-NFPA 70-2018 [Section No. 770.110(A)]

(A) Types of Raceways.

Optical fiber cables shall be permitted to be installed in any raceway that complies with either 770.110(A)(1) or (A)(2) ~~and in cable routing assemblies installed in compliance with 770.110(C)~~ .

(1) Raceways Recognized in Chapter 3.

Optical fiber cables shall be permitted to be installed in any raceway included in Chapter 3. The raceways shall be installed in accordance with the requirements of Chapter 3.

(2) Communications Raceways.

Optical fiber cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 800.154(b), listed in accordance with ~~800.182~~ 800.113 , and installed in accordance with ~~800.113 and~~ 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(3) Innerduct for Optical Fiber Cables.

Listed plenum communications raceway, listed riser communications raceway, and listed general-purpose communications raceway selected in accordance with ~~the provisions of~~ Table 800.154(b) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 08:25:48 EST 2018

Committee Statement and Meeting Notes

Committee Statement: 770.110(A) pertains to raceways. The deleted text refers to cable routing assemblies, which are covered in 770.110(C), and was out of place in this paragraph.

The phrase "the provisions of" was deleted because it was superfluous text.

Response Message:

Public Input No. 83-NFPA 70-2017 [Section No. 770.110(A)]

Public Input No. 3362-NFPA 70-2017 [Section No. 770.110(A)(2)]

First Revision No. 7608-NFPA 70-2018 [Section No. 770.113(B)]

(B) Ducts Specifically Fabricated for Environmental Air.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(1) Up to 1.22 m (4 ft) of Types OFNP and OFCP

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that are installed in compliance with 300.22(B)

Informational Note: For information on fire protection of wiring installed in fabricated ducts, see ~~4.3.4.1 and 4.3.11.3.3 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
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Street Address:
City:
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Submittal Date: Tue Jan 09 08:40:53 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The reference to NFPA 90A is updated to the current edition.
Response Message:

Committee Notes:

Date	Submitted By	
Jan 17, 2018	NEC-CMP Panel 16	Only changes are to the Informational Note.

Public Input No. 112-NFPA 70-2017 [Section No. 770.113(B)]

First Revision No. 7610-NFPA 70-2018 [Section No. 770.113(C)]

(C) Other Spaces Used for Environmental Air (Plenums).

The following cables shall be permitted in other spaces used for environmental air as described in 300.22(C):

(1) Types OFNP and OFCP

(2) Types OFNP and OFCP installed in plenum communications raceways listed in accordance with 800.182

(3) Types OFNP and OFCP installed in plenum cable routing assemblies listed in accordance with 800.182

(4) Types OFNP and OFCP supported by open ~~metallic~~ metal cable ~~trays or cable~~ tray systems

(5) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that are installed in compliance with 300.22(C)

(6) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 300.22(C)

(7) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in plenum communications raceways, riser communications raceways, or general-purpose communications raceways listed in accordance with 800.182 or supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 300.22(C)

Informational Note: For information on fire protection of wiring installed in other spaces used for environmental air, see ~~4.3.11.2, 4.3.11.4, and 4.3.11.5 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

Supplemental Information

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Panel_16_FR-7610_770.113_C_leg_changes.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 08:49:00 EST 2018

Committee Statement and Meeting Notes

Committee Statement: In list item (4), cable tray systems is the preferred term.

"Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal, such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc in the National Electrical Code.

In the Informational Note, the reference to NFPA 90A was updated to the current edition.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 12, 2018	NEC-CMP Panel 16	Changes are in item (4) and item (7) informational note.

Public Input No. 114-NFPA 70-2017 [Section No. 770.113(C)]

First Revision No. 7633-NFPA 70-2018 [Section No. 770.179 [Excluding any Sub-Sections]]

Optical fiber cables shall be listed and identified in accordance with 770.179(A) through (F) and shall be marked in accordance with Table 770.179. Optical fiber cables shall have a temperature rating of not less than 60°C (140°F). ~~Temperature~~ The temperature rating shall be marked on the jacket of optical fiber cables that have a temperature rating exceeding 60°C (140°F).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
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Submittal Date: Tue Jan 09 10:36:45 EST 2018

Committee Statement and Meeting Notes

Committee Statement: This revision is editorial and improves readability.
Response Message:

Public Input No. 65-NFPA 70-2017 [Section No. 770.179 [Excluding any Sub-Sections]]

Public Input No. 165-NFPA 70-2017 [Section No. 770.179 [Excluding any Sub-Sections]]

First Revision No. 7657-NFPA 70-2018 [Definition: Communications Circuit.]

Communications Circuit.

The circuit that ~~extends voice, audio, video, data, interactive services, telegraph (except radio), outside wiring for fire alarm and burglar alarm~~ electrically extends service from the communications utility or service provider up to and including the customer's communications equipment ~~up to and including terminal equipment such as a telephone, fax machine, or answering machine~~ .

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Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Tue Jan 09 13:02:36 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The “list” of service types has resulted in misinterpretation of the definition and is deleted for enhanced clarity and usability.

The term “utility” is defined by the respective State Public Service Commission/Public Utility Commissions as the regulated part of telecommunications companies. In an increasing number of situations telecommunications services are being provided by the non-regulated part of these companies or by other entities; therefore, the need for adding the term “service provider” to ensure that the user has a understanding that the Code applies to these other providers also.

Response Message:

Public Input No. 795-NFPA 70-2017 [Definition: Communications Circuit.]

Public Input No. 4190-NFPA 70-2017 [Definition: Communications Circuit.]

First Revision No. 7669-NFPA 70-2018 [Section No. 800.3(H)]

800.27 Temperature Limitation of ~~Conductors~~ Wires and Cables .

~~Section 310.15(A)(3) shall apply~~ No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating .

Supplemental Information

File Name	Description	Approved
Panel_16_FR-7669_800.3_H_leg_changes.docx	For staff use	✓

Submitter Information Verification

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Committee Statement and Meeting Notes

Committee Statement: The new text simplifies the Code by including the requirement in Article 800, rather than a cross-reference. The requirement is moved to a new section because it no longer belongs under 800.3 without the cross-reference.

Response Message:

Public Input No. 66-NFPA 70-2017 [Section No. 800.3(H)]

First Revision No. 7683-NFPA 70-2018 [Section No. 800.24]

800.24 Mechanical Execution of Work.

Communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4(D) and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).

Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA-568.1-D-2015, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards.

Informational Note No. 2: See ~~4.3.11.2.6.5 and 4.3.11.5.5.6 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of communications wire and cable properties.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Tue Jan 09 15:07:27 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The reference to NFPA 90A is updated with the current edition.
Response Message:

Committee Notes:

Date	Submitted By	
Jan 17, 2018	NEC-CMP Panel 16	Only change is in Informational Note no. 2.

Public Input No. 162-NFPA 70-2017 [Section No. 800.24]

First Revision No. 7698-NFPA 70-2018 [Section No. 800.49]

800.49 ~~Metallic~~ Metal Entrance Conduit Grounding.

~~Metallic~~ Metal conduit containing communications entrance wire or cable shall be connected by a bonding conductor or grounding electrode conductor to ~~a grounding electrode in~~ the building grounding electrode system in accordance with 800.100(B).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
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City:
State:
Zip:
Submittal Date: Tue Jan 09 16:13:50 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The revisions dealing with grounding are consistent with usage throughout the Code.

Response Message:

Public Input No. 2067-NFPA 70-2017 [Section No. 800.49]

Public Input No. 2923-NFPA 70-2017 [Section No. 800.49]

Public Input No. 3580-NFPA 70-2017 [Section No. 800.49]

First Revision No. 7709-NFPA 70-2018 [Section No. 800.53]

800.53 Separation from Lightning Conductors.

Where practicable, a separation of at least 1.8 m (6 ft) shall be maintained between communications wires and cables on buildings and lightning conductors.

Informational Note: Specific separation distances may be calculated from the sideflash equation in NFPA 780-~~2014~~ 2017 , *Standard for the Installation of Lightning Protection Systems*~~, 4.16.2~~ .

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 16:38:40 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The title is revised to better describe the content of this section. The reference to NFPA 780 in the Informational Note is updated to the current edition.
Response Message:

Editorial Comment

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First Revision No. 7714-NFPA 70-2018 [Section No. 800.93]

800.93 Grounding, Bonding, or Interruption of Non–Current-Carrying Metallic Sheath Members of Communications Cables.

Communications cables entering the building or terminating on the outside of the building shall comply with 800.93(A) or ~~800.93(B)~~ (B) .

(A) Entering Buildings.

In installations where the communications cable enters a building, the metallic sheath members of the cable shall be ~~either~~ grounded or bonded as specified in 800.100 or interrupted by an insulating joint or equivalent device. The grounding, bonding, or interruption shall be as close as practicable to the point of entrance.

(B) Terminating on the Outside of Buildings.

In installations where the communications cable is terminated on the outside of the building, the metallic sheath members of the cable shall be ~~either~~ grounded or bonded as specified in 800.100 or interrupted by an insulating joint or equivalent device. The grounding, bonding, or interruption shall be as close as practicable to the point of termination of the cable.

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Submittal Date: Tue Jan 09 17:18:22 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The addition of the terms "bonded" and "bonding" coordinates with the requirements of 800.100.

Response Message:

Public Input No. 2068-NFPA 70-2017 [Section No. 800.93]

Editorial Comment

Click here

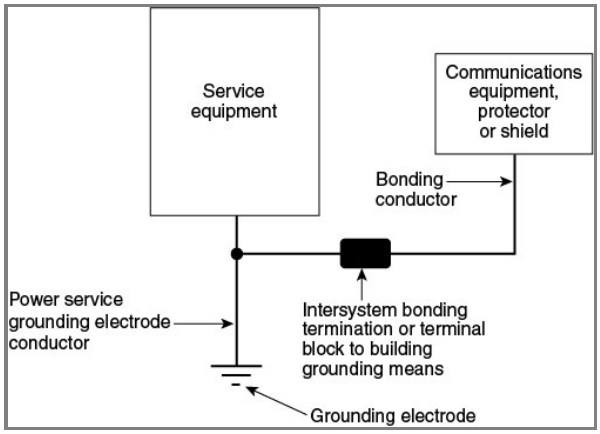
First Revision No. 7715-NFPA 70-2018 [Section No. 800.100(B)(1)]

(1) In Buildings or Structures with an Intersystem Bonding Termination.

If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.

Informational Note: Informational Note Figure 800.100(B)(1) illustrates the connection of the bonding conductor in buildings or structures equipped with an intersystem bonding termination or a terminal block providing access to the building grounding means.

Figure Informational Note Figure 800.100(B)(1) Illustration of a Bonding Conductor in a Communications Installation.



Supplemental Information

File Name	Description	Approved
70_FR7715_800.100_B_1_.docx	For Staff Use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 17:40:30 EST 2018

Committee Statement and Meeting Notes

Committee Statement: This new informational note, including the revised Figure 800(a) from Section 800.1, will closely associate the informational note with the requirement to which it pertains. The original placement created a "floating" informational note that is not directly associated with a specific requirement.

Response Message:

Public Input No. 894-NFPA 70-2017 [Section No. 800.100(B)(1)]

First Revision No. 7716-NFPA 70-2018 [Section No. 800.100(B)(2)]

Detail FR-7717

(2) In Buildings or Structures with Grounding Means.

If an intersystem bonding termination is established, 250.94(A) shall apply.

If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible ~~metallic~~ metal power service raceway

(5) The service equipment enclosure

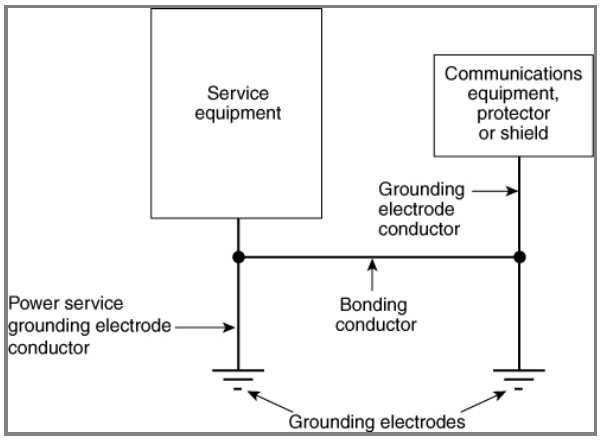
(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is ~~grounded~~ connected to ~~an~~ a grounding electrode as covered in 250.32

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.

Informational Note: Informational Note Figure 800.100(B)(2) illustrates the connection of the bonding conductor in buildings or structures not equipped with an intersystem bonding termination or terminal block providing access to the building grounding means.

Figure Informational Note Figure 800.100(B)(2) Illustration of a Grounding Electrode Conductor in a Communications Installation.



For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 800.90(B), shall be considered accessible.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Tue Jan 09 17:46:44 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The revisions dealing with grounding are consistent with usage throughout the Code.

Response Message:

Public Input No. 3339-NFPA 70-2017 [Section No. 800.100(B)(2)]

Public Input No. 2925-NFPA 70-2017 [Section No. 800.100(B)]

First Revision No. 7741-NFPA 70-2018 [Section No. 800.110]

800.110 Raceways, ~~and~~ Cable Routing Assemblies, and Cable Trays for Communications Wires and Cables.

(A) Types of Raceways.

Communications wires and cables shall be permitted to be installed in any raceway that complies with either 800.110(A)(1) or (A)(2) ~~and in cable routing assemblies installed in compliance with 800.110(C)~~ .

(1) Raceways Recognized in Chapter 3.

Communications wires and cables shall be permitted to be installed in any raceway included in Chapter 3. The raceways shall be installed in accordance with the requirements of Chapter 3.

(2) Communications Raceways.

Communications wires and cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 800.154(b) , listed in accordance with 800.182, and installed in accordance with 800.113 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(3) Innerduct for Communications Wires and Cables.

Listed plenum communications ~~raceway~~ raceways , listed riser communications ~~raceway~~ raceways , and listed general-purpose communications ~~raceway~~ raceways selected in accordance with Table 800.154(b) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

(B) Raceway Fill for Communications Wires and Cables.

The raceway fill requirements of Chapters 3 and 9 shall not apply to communications wires and cables.

(C) Cable Routing Assemblies.

Communications wires and cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 800.154(c) , listed in accordance with 800.182, and installed in accordance with 800.110(C)(1) and (C)(2) and 800.113.

(1) Horizontal Support.

Cable routing assemblies shall be supported where run horizontally at intervals not to exceed 900 mm (3 ft)~~,~~ and at each end or joint, unless listed for other support intervals. In no case shall the distance between supports exceed 3 m (10 ft).

(2) Vertical Support.

Vertical runs of cable routing assemblies shall be supported at intervals not exceeding 1.2 m (4 ft), unless listed for other support intervals, and shall not have more than one joint between supports.

(D) Cable Trays.

Communications cables and communications raceways shall be permitted to be installed in metal or listed nonmetallic cable tray systems. Ladder cable trays shall be permitted to support cable routing assemblies.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 07:25:27 EST 2018

Committee Statement and Meeting Notes

Committee Statement: 800.110(A) pertains to raceways. The deleted text refers to cable routing assemblies, which are covered in 800.110(C), and was out of place in this paragraph.

New 800.110(D) is added because cable trays and cable routing assemblies perform similar functions. The code becomes more user-friendly if they are covered in the same section. The new requirement limits the allowance to metal and listed nonmetallic in order to address flame spread concerns.

Response Message:

Public Input No. 76-NFPA 70-2017 [New Section after 800.110(B)]

Public Input No. 80-NFPA 70-2017 [Section No. 800.110]

Public Input No. 84-NFPA 70-2017 [Section No. 800.110(A)]

Editorial Comment

Click here

First Revision No. 7748-NFPA 70-2018 [Section No. 800.113(B)]

(B) Ducts Specifically Fabricated for Environmental Air.

The following wires and cables shall be permitted in ducts ~~used~~ specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(1) Up to 1.22 m (4 ft) of Type CMP cable

(2) Types CMP, CMR, CMG, CM, and CMX cables and communications wires installed in raceways that are installed in compliance with 300.22(B)

Informational Note: For information on fire protection of wiring installed in fabricated ducts, see ~~4.3.4.1 and 4.3.11.3.3 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

Submitter Information Verification

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Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:03:48 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The term "used" is replaced by "specifically fabricated" for consistency.

The reference to NFPA 90A was updated to the current edition.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 17, 2018	NEC-CMP Panel 16	No changes to the title.

Public Input No. 110-NFPA 70-2017 [Section No. 800.113(B)]

First Revision No. 7752-NFPA 70-2018 [Section No. 800.113(C)]

(C) Other Spaces Used for Environmental Air (Plenums).

The following wires, cables, raceways, and cable routing assemblies shall be permitted in other spaces used for environmental air as described in 300.22(C):

(1) Type CMP cables

(2) Plenum communications raceways

(3) Plenum cable routing assemblies

(4) Type CMP cables installed in plenum communications raceways

(5) Type CMP cables installed in plenum cable routing assemblies

(6) Type CMP cables and plenum communications raceways supported by open ~~metallic~~ metal cable ~~trays or cable~~ tray systems

(7) Types CMP, CMR, CMG, CM, and CMX cables and communications wires installed in raceways that are installed in compliance with 300.22(C)

(8) Types CMP, CMR, CMG, CM, and CMX cables, plenum communications raceways, riser communications raceways, and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

(9) Types CMP, CMR, CMG, CM, and CMX cables installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

Informational Note: For information on fire protection of wiring installed in other spaces used for environmental air, see ~~4.3.11.2, 4.3.11.4, and 4.3.11.5 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

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Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

"Cable tray systems" is the preferred term.

The reference to NFPA 90A was updated to the current edition.

Response Message:

Public Input No. 115-NFPA 70-2017 [Section No. 800.113(C)]

First Revision No. 7757-NFPA 70-2018 [Section No. 800.113(J)]

(J) Other Building Locations.

The following wires, cables, raceways, and cable routing assemblies shall be permitted to be installed in building locations other than the locations covered in 800.113(B) through (I):

(1) Types CMP, CMR, CMG, and CM cables

(2) A maximum of 3 m (10 ft) of exposed Type CMX cable in nonconcealed spaces

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Communications wires and Types CMP, CMR, CMG, and CM cables installed in the following :

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(6) Types CMP, CMR, CMG, and CM cables installed in the following :

a. Plenum cable routing assemblies

b. Riser cable routing assemblies

c. General-purpose cable routing assemblies

(7) Communications wires and Types CMP, CMR, CMG, CM, and CMX cables installed in raceways recognized in Chapter 3

(8) Type CMUC under-carpet communications wires and cables installed under carpet, modular ~~tiles~~ flooring , and planks

Supplemental Information

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State:
Zip:
Submittal Date: Wed Jan 10 08:15:13 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The word "cable" was added after "Type CMX" for clarity and consistency. The text “modular tiles” was changed to “modular flooring” because there are other types of modular flooring than tiles.

Response Message:

Public Input No. 131-NFPA 70-2017 [Section No. 800.113(J)]

Editorial Comment

Click here

First Revision No. 7760-NFPA 70-2018 [Section No. 800.113(K)]

(K) Multifamily Dwellings.

The following cables, raceways, and cable routing assemblies shall be permitted to be installed in multifamily dwellings in locations other than the locations covered in 800.113(B) through (G):

(1) Types CMP, CMR, CMG, and CM cables

(2) Type CMX cables less than 6 mm (0.25 in.) in diameter in nonconcealed spaces

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Communications wires and Types CMP, CMR, CMG, and CM cables installed in the following :

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(6) Types CMP, CMR, CMG, and CM cables installed in the following :

a. Plenum cable routing assemblies

b. Riser cable routing assemblies

c. General-purpose cable routing assemblies

(7) Communications wires and Types CMP, CMR, CMG, CM, and CMX cables installed in raceways recognized in Chapter 3

(8) Type CMUC under-carpet communications wires and cables installed under carpet, modular ~~tiles~~ flooring , and planks

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:21:20 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The text “modular tiles” was changed to “modular flooring” because there are other types of modular flooring than tiles.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 17, 2018	NEC-CMP Panel 16	Only change is in list item (8).

Public Input No. 132-NFPA 70-2017 [Section No. 800.113(K)]

Editorial Comment

Click here

First Revision No. 7762-NFPA 70-2018 [Section No. 800.113(L)]

(L) One- and Two-Family Dwellings.

The following wires, cables, raceways, and cable routing assemblies shall be permitted to be installed in one- and two-family dwellings in locations other than the locations covered in 800.113(B) through ~~800.113(F)~~ (F) :

(1) Types CMP, CMR, CMG, and CM cables

(2) Type CMX cables less than 6 mm (0.25 in.) in diameter

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Communications wires and Types CMP, CMR, CMG, and CM cables installed in the following :

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(6) Types CMP, CMR, CMG, and CM cables installed in the following :

a. Plenum cable routing assemblies

b. Riser cable routing assemblies

c. General-purpose cable routing assemblies

(7) Communications wires and Types CMP, CMR, CMG, CM, and CMX cables installed in raceways recognized in Chapter 3

(8) Type CMUC under-carpet communications wires and cables installed under carpet, modular ~~tiles~~ flooring , and planks

(9) Hybrid power and communications cable listed in accordance with 800.179(J)

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Wed Jan 10 08:24:23 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The text "wires" was added to correct an omission.

The text “modular tiles” was changed to “modular flooring” because there are other types of modular flooring than tiles.

Response Message:

Committee Notes:

Date	Submitted By

Jan 17, 2018	NEC-CMP Panel 16	Changes are in main text and list item (8).

Public Input No. 133-NFPA 70-2017 [Section No. 800.113(L)]

Editorial Comment

Click here

First Revision No. 7763-NFPA 70-2018 [Section No. 800.133(A)(1)]

(1) In Raceways, Cable Trays, Boxes, Cables, Enclosures, and Cable Routing Assemblies.

(a) *Other Circuits.* Communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with cables of any of the following:

(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 645 or Parts I and III of Article 725

(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(3) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770

(4) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(5) Low-power network-powered broadband communications circuits in compliance with Parts I and V of Article 830

(b) *Class 2 and Class 3 Circuits.* Class 1 circuits shall not be run in the same cable with communications circuits. Class 2 and Class 3 circuit conductors shall be permitted in the same listed communications cable with communications circuits~~, in which case the Class 2 and Class 3 circuits shall be classified as communications circuits and shall meet the requirements of this article. The cables shall be listed as communications cables~~ .

~~Exception: Cables constructed of individually listed Class 2, Class 3, and communications cables under a common jacket shall not be required to be classified as communications cable. The fire-resistance rating of the composite cable shall be determined by the performance of the composite cable.~~

(c) *Electric Light, Power, Class 1, Non–Power-Limited Fire Alarm, and Medium-Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes.* Communications conductors shall not be placed in any raceway, compartment, outlet box, junction box, or similar fitting with conductors of electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuits.

Exception No. 1: Section 800.133(A)(1)(c) shall not apply if all of the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from all of the conductors of communications circuits by a permanent barrier or listed divider.

Exception No. 2: Power conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to communications equipment. The power circuit conductors shall be routed within the enclosure to maintain a minimum of 6 mm (¼ in.) separation from the communications circuit conductors.

Exception No. 3: As permitted by 620.36.

Supplemental Information

File Name	Description	Approved
70_FR7763_800.133_A_1_b_.docx	For Staff Use--FINAL	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:

Zip:

Submittal Date: Wed Jan 10 08:27:47 EST 2018

Committee Statement and Meeting Notes

Committee Statement: This revision corrects a longstanding issue with reclassification of circuits within the same cable. A Class 2 or Class 3 power circuit is defined by its source and should not be reclassified based on the type of cable used.

Response Message:

Public Input No. 72-NFPA 70-2017 [Section No. 800.133(A)(1)]

First Revision No. 7769-NFPA 70-2018 [Section No. 800.154]

800.154 Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies.

Permitted and nonpermitted applications of listed communications wires, cables, and raceways, and listed cable routing assemblies, shall be in accordance with one of the following:

(1) Listed communications wires and cables as indicated in Table 800.154(a)

(2) Listed communications raceways as indicated in Table 800.154(b)

(3) Listed cable routing assemblies as indicated in Table 800.154(c)

The permitted applications shall be subject to the installation requirements of 800.110 and 800.113. The substitutions for communications cables listed in Table 800.154(d) and illustrated in Figure 800.154 shall be permitted.

Table 800.154(a) Applications of Listed Communications Wires and Cables in Buildings

Applications		Wire and Cable Type						
		CMP	CMR	CMG CM	CMX	CMUC	Hybrid ~~power~~ Power and Communications ~~cables~~ Cables	Communications ~~wires~~ Wires
In ducts specifically fabricated for environmental air as described in 300.22(B)	In fabricated ducts	Y*	N	N	N	N	N	N
	In metal raceway that complies with 300.22(B)	Y*	Y*	Y*	Y*	N	N	Y*
In other spaces used for environmental air (plenums) as ~~(plenums)~~ described in 300.22(C)	In other spaces used for environmental air	Y*	N	N	N	N	N	N
	In metal raceway that complies with 300.22(C)	Y*	Y*	Y*	Y*	N	N	Y*
	In plenum communications raceways	Y*	N	N	N	N	N	N
	In plenum cable routing assemblies	Y*	N	N	N	N	N	N
	Supported by open metal cable trays	Y*	N	N	N	N	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y*	Y*	Y*	Y*	N	N	N
In risers	In vertical runs	Y*	Y*	N	N	N	N	N
	In metal raceways	Y*	Y*	Y*	Y*	N	N	N
	In fireproof shafts	Y*	Y*	Y*	Y*	N	N	N
	In plenum communications raceways	Y*	Y*	N	N	N	N	N
	In plenum cable routing assemblies	Y*	Y*	N	N	N	N	N

Applications		Wire and Cable Type						
		CMP	CMR	CMG CM	CMX	CMUC	Hybrid ~~power~~ Power and Communications ~~cables~~ Cables	Communications ~~wires~~ Wires
	In riser communications raceways	Y*	Y*	N	N	N	N	N
	In riser cable routing assemblies	Y*	Y*	N	N	N	N	N
	In one- and two-family dwellings	Y*	Y*	Y*	Y*	N	Y*	N
Within buildings in other than air-handling spaces and risers	General	Y*	Y*	Y*	Y*	N	N	N
	In one- and two-family dwellings	Y*	Y*	Y*	Y*	Y*	Y*	N
	In multifamily dwellings	Y*	Y*	Y*	Y*	Y*	N	N
	In nonconcealed spaces	Y*	Y*	Y*	Y*	Y*	N	N
	Supported by cable trays	Y*	Y*	Y*	N	N	N	N
	Under carpet ~~or under floor covering~~ , modular ~~tiles~~ flooring , and planks	N	N	N	N	Y*	N	N
	In distributing frames and cross-connect arrays	Y*	Y*	Y*	N	N	N	Y*
	In any raceway recognized in Chapter 3	Y*	Y*	Y*	Y*	N	N	Y*
	In plenum communications raceways	Y*	Y*	Y*	N	N	N	Y*
	In plenum cable routing assemblies	Y*	Y*	Y*	N	N	N	Y*
	In riser communications raceways	Y*	Y*	Y*	N	N	N	Y*
	In riser cable routing assemblies	Y*	Y*	Y*	N	N	N	Y*
	In general-purpose communications raceways	Y*	Y*	Y*	N	N	N	Y*
	In general-purpose cable routing	Y*	Y*	Y*	N	N	N	Y*

Applications	Wire and Cable Type						
	CMP	CMR	CMG CM	CMX	CMUC	Hybrid ~~power~~ Power and Communications ~~cables~~ Cables	Communications ~~wires~~ Wires
assemblies							

Note: An “N” in the table indicates that the cable type ~~is~~ shall not be permitted to be installed in the application. A “Y*” indicates that the cable type ~~is~~ shall be permitted to be installed in the application subject to the limitations described in 800.113.

Informational Note No. 1: Part V of Article 800 covers installation methods within buildings. This table covers the applications of listed communications wires, cables, and raceways in buildings. See the definition of Point of Entrance in 800.2.

Informational Note No. 2: For information on the restrictions to the installation of communications cables in fabricated ducts, see 800.113(B).

Table 800.154(b) Applications of Listed Communications Raceways in Buildings

- Applications		Listed Communications Raceway Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 300.22(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 300.22(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 300.22(C)	In other spaces used for environmental air	Y*	N	N
	In metal raceway that complies with 300.22(C)	Y*	Y*	Y*
	In plenum cable routing assemblies	N	N	N
	Supported by open metal cable trays	Y*	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y*	Y*	Y*
In risers	In vertical runs	Y*	Y*	N
	In metal raceways	Y*	Y*	Y*
	In fireproof shafts	Y*	Y*	Y*
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N
	In one- and two-family dwellings	Y*	Y*	Y*
Within buildings in other than air-handling spaces and risers	General	Y*	Y*	Y*
	In one- and two-family dwellings	Y*	Y*	Y*
	In multifamily dwellings	Y*	Y*	Y*
	In nonconcealed spaces	Y*	Y*	Y*
	Supported by cable trays	Y*	Y*	Y*
	Under carpet ~~or under floor covering~~ , modular ~~tiles~~ flooring , and planks	N	N	N
	In distributing frames and cross-connect arrays	Y*	Y*	Y*
	In any raceway recognized in Chapter 3	Y*	Y*	Y*

Applications		Listed Communications Raceway Type		
		Plenum	Riser	General-Purpose
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N
	In general-purpose cable routing assemblies	N	N	N

Note: An “N” in the table indicates that the communications raceway type shall not be permitted to be installed in the application. A “Y*” indicates that the communications raceway type shall be permitted to be installed in the application, subject to the limitations described in 800.110 and 800.113.

Table 800.154(c) Applications of Listed Cable Routing Assemblies in Buildings

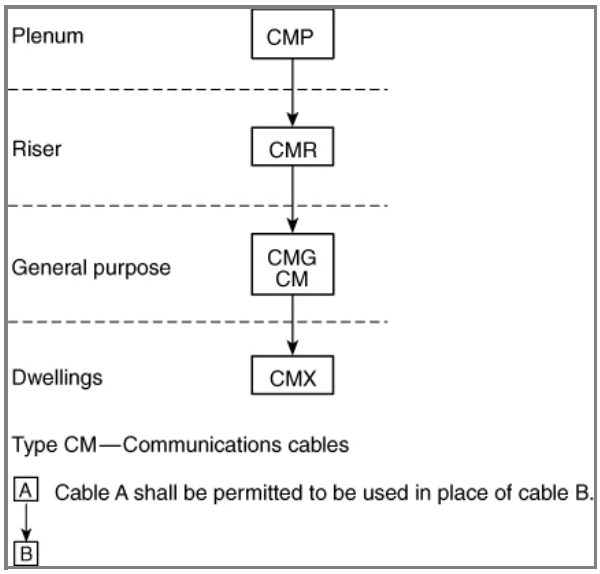
Applications		Listed Cable Routing Assembly Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 300.22(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 300.22(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 300.22(C)	In other spaces used for environmental air	Y*	N	N
	In metal raceway that complies with 300.22(C)	N	N	N
	In plenum communications raceways	N	N	N
	Supported by open metal cable trays	~~N~~ Y*	N	N
	Supported by solid bottom metal cable trays with solid metal covers	N	N	N
In risers	In vertical runs	Y*	Y*	N
	In metal raceways	N	N	N
	In fireproof shafts	Y*	Y*	Y*
	In plenum communications raceways	N	N	N
	In riser communications raceways	N	N	N
	In one- and two-family dwellings	Y*	Y*	Y*
Within buildings in other than air-handling spaces and risers	General	Y*	Y*	Y*
	In one- and two-family dwellings	Y*	Y*	Y*
	In multifamily dwellings	Y*	Y*	Y*
	In nonconcealed spaces	Y*	Y*	Y*
	Supported by cable trays	~~N~~ Y*	~~N~~ Y*	~~N~~ Y*
	Under carpet ~~or under floor covering~~ , modular ~~tiles~~ flooring , and planks	N	N	N
	In distributing frames and cross-connect arrays	Y*	Y*	Y*
	In any raceway recognized in Chapter 3	N	N	N
	In plenum communications raceways	N	N	N
	In riser communications raceways	N	N	N
	In general-purpose communications raceways	N	N	N

Note: An “N” in the table indicates that the cable routing assembly type shall not be permitted to be installed in the application. A “Y*” indicates that the cable routing assembly type shall be permitted to be installed in the application subject to the limitations described in 800.113.

Table 800.154(d) Cable Substitutions

Cable Type	Permitted Substitutions
CMR	CMP
CMG, CM	CMP, CMR
CMX	CMP, CMR, CMG, CM

Figure 800.154 Cable Substitution Hierarchy.



Supplemental Information

File Name	Description	Approved
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Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:49:34 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The text “modular tiles” was changed to “modular flooring” because there are other types of modular flooring than tiles.

Table 800.154(c) is revised to permit cable trays to support cable routing assemblies.

The revised note following Table 800.154(a) correlates with the similar notes following Tables 800.154(b) and (c).

Response Message:

Public Input No. 141-NFPA 70-2017 [Section No. 800.154]

Editorial Comment

Click here

First Revision No. 7779-NFPA 70-2018 [Section No. 800.170 [Excluding any Sub-Sections]]

Communications equipment shall be listed as being suitable for electrical connection to a communications network.

Informational Note No. 1: One way to determine applicable requirements is to refer to ANSI/UL 60950-1-2014, *Standard for Safety of Information Technology Equipment*; ~~UL 1459-1998, *Standard for Safety Telephone Equipment* ;~~ ANSI/UL 1863-2012, *Standard for Safety Communications Circuit Accessories*; or ANSI/UL 62368-1-2014, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*.

Informational Note No. 2: Additional information regarding voltages, currents, and power allowed on communications circuits can be found in ANSI/ATIS 0600337-2016, *Requirements for Maximum Voltage, Current, and Power Levels Used in Communications Transport Circuits* .

Supplemental Information

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Submitter Information Verification

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Submittal Date: Wed Jan 10 09:43:39 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The reference to UL 1459 is obsolete and has been removed.

The new informational note was added to reference the ANSI standard that defines the voltage, current, and power levels allowed in North America on communications networks.

Response Message:

Public Input No. 4205-NFPA 70-2017 [Section No. 800.170 [Excluding any Sub-Sections]]

Public Input No. 4197-NFPA 70-2017 [Section No. 800.170 [Excluding any Sub-Sections]]

Editorial Comment

Click here

First Revision No. 7793-NFPA 70-2018 [Section No. 800.182(C)]

(C) General-Purpose Cable Routing Assemblies and General-Purpose ~~Communication~~ Communications Raceways.

General-purpose cable routing assemblies and general-purpose communications raceways shall be listed as being resistant to the spread of fire.

Informational Note: One method of defining *resistant to the spread of fire* is that the cable routing assemblies and communications raceways do not spread fire to the top of the tray in the “UL Flame Exposure, Vertical Flame Tray Test” in ANSI/UL 1685-2011, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 10:32:34 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The word “Communication” is editorially revised to "Communications” as that is the correct term.

Response Message:

Public Input No. 19-NFPA 70-2017 [Section No. 800.182(C)]

Editorial Comment

Click here

First Revision No. 7933-NFPA 70-2018 [Section No. 810.21(A)]

(A) Material.

The bonding conductor or grounding electrode conductor shall be of copper, aluminum, copper-clad steel, copper-clad aluminum, bronze, or similar corrosion-resistant material. Aluminum or copper-clad aluminum bonding conductors or grounding electrode conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions. Where used outside, aluminum or copper-clad aluminum conductors shall not be installed within 450 mm (18 in.) of the earth.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 10:49:27 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The term "copper-clad aluminum" appears later in this text in describing installation processes but was omitted from this paragraph in previous editions of the code.

Response Message:

Public Input No. 2139-NFPA 70-2017 [Section No. 810.21(A)]

First Revision No. 7947-NFPA 70-2018 [Section No. 820.24]

820.24 Mechanical Execution of Work.

Community television and radio distribution systems shall be installed in a neat and workmanlike manner. Coaxial cables installed exposed on the surface of ceiling and sidewalls shall be supported by the building structure in such a manner that the cables will not be damaged by normal building use. Such cables shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform to 300.4(D) and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).

Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568–2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA-568.1-D-2015, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards.

Informational Note No. 2: See ~~4.3.11.2.6.5 and 4.3.11.5.5.6 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of coaxial cable properties.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:32:55 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The reference to NFPA 90A was updated to the current edition.
Response Message:

Public Input No. 163-NFPA 70-2017 [Section No. 820.24]

First Revision No. 7948-NFPA 70-2018 [Section No. 820.49]

820.49 ~~Metallic~~ Metal Entrance Conduit Grounding.

~~Metallic~~ Metal conduit containing entrance coaxial cable shall be connected by a bonding conductor or grounding electrode conductor to ~~a~~ the building grounding electrode system in accordance with 820.100(B).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:40:24 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The revisions dealing with grounding are consistent with usage throughout the Code.

Response Message:

Public Input No. 2928-NFPA 70-2017 [Section No. 820.49]

First Revision No. 7954-NFPA 70-2018 [Section No. 820.110]

820.110 Raceways, ~~and~~ Cable Routing Assemblies, and Cable Trays for Coaxial Cables.

(A) Types of Raceways.

Coaxial cables shall be permitted to be installed in any raceway that complies with either 820.110(A)(1) or (A)(2) ~~and in cable routing assemblies installed in compliance with 820.110(C)~~ .

(1) Raceways Recognized in Chapter 3.

Coaxial cables shall be permitted to be installed in any raceway included in Chapter 3. The raceways shall be installed in accordance with the requirements of Chapter 3.

(2) Communications Raceways.

Coaxial cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways, selected in accordance with Table 800.154(b) , listed in accordance with 800.182, and installed in accordance with 800.113 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(3) Innerduct for Coaxial Cables.

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 800.154(b) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

(B) Raceway Fill for Coaxial Cables.

The raceway fill requirements of Chapters 3 and 9 shall not apply to coaxial cables.

(C) Cable Routing Assemblies.

Coaxial cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 800.154(c) , listed in accordance with 800.182, and installed in accordance with 800.110(C) and 800.113.

(D) Cable Trays.

Coaxial cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
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Street Address:
City:
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Zip:
Submittal Date: Thu Jan 11 12:57:15 EST 2018

Committee Statement and Meeting Notes

Committee Statement: 820.110(A) pertains to raceways. The deleted text refers to cable routing assemblies, which are covered in 820.110(C), and was out of place in this paragraph.

New 820.110(D) is added because cable trays and cable routing assemblies perform similar functions. The code becomes more user-friendly if they are covered in the same section. The new requirement limits the allowance to metal and listed nonmetallic in order to address flame spread concerns. The title is revised to reflect this new content.

Response Message:

Public Input No. 85-NFPA 70-2017 [Section No. 820.110(A) [Excluding any Sub-Sections]]

Public Input No. 81-NFPA 70-2017 [Section No. 820.110]

Public Input No. 77-NFPA 70-2017 [New Section after 820.110(B)]

Editorial Comment

Click here

First Revision No. 7808-NFPA 70-2018 [Definition: Network-Powered Broadband Communications Circui...]

Network-Powered Broadband Communications Circuit.

The circuit extending from the communications utility's or service provider's serving terminal or tap up to and including the NIU.

Informational Note: A typical one-family dwelling network-powered communications circuit consists of a communications drop or communications service cable and an NIU and includes the communications utility's serving terminal or tap where it is not under the exclusive control of the communications utility.

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Committee Statement and Meeting Notes

Committee Statement: The revision adds the term "service provider" to the definition of network-powered broadband communications circuit to address situations where the service is not provided by a regulated utility.

Response Message:

Public Input No. 796-NFPA 70-2017 [Definition: Network-Powered Broadband Communications Circui...]

First Revision No. 7832-NFPA 70-2018 [Section No. 830.24]

830.24 Mechanical Execution of Work.

Network-powered broadband communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4(A), (D), (E), (F), and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).

Informational Note No. 1: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA-568.1-D-2015, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-D-2015, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-2010, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards.

Informational Note No. 2: See ~~4.3.11.2.6.5 and 4.3.11.5.5.6 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of network-powered broadband cable properties.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 13:45:20 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The reference to NFPA 90A is updated to the current edition.

Response Message:

Public Input No. 164-NFPA 70-2017 [Section No. 830.24]

Editorial Comment

Click here

First Revision No. 7838-NFPA 70-2018 [Section No. 830.49]

830.49 ~~Metallic~~ Metal Entrance Conduit Grounding.

~~Metallic~~ Metal conduit containing network-powered broadband communications entrance cable shall be connected by a bonding conductor or grounding electrode conductor to ~~a grounding electrode in~~ the building grounding electrode system in accordance with 830.100(B).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 14:13:06 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The revisions dealing with grounding are consistent with usage throughout the Code.

Response Message:

Public Input No. 2929-NFPA 70-2017 [Section No. 830.49]

First Revision No. 7844-NFPA 70-2018 [Section No. 830.110]

830.110 Raceways, ~~and~~ Cable Routing Assemblies, and Cable Trays for Network-Powered Broadband Communications Cables.

(A) Types of Raceways.

Low-power network-powered broadband communications cables shall be permitted to be installed in any raceway that complies with either 830.110(A)(1) or (A)(2) ~~and in cable routing assemblies installed in compliance with 830.110(C)~~ . Medium-power network-powered broadband communications cables shall be permitted to be installed in any raceway that complies with 830.110(A)(1).

(1) Raceways Recognized in Chapter 3.

Low- and medium-power network-powered broadband communications cables shall be permitted to be installed in any raceway included in Chapter 3. The raceways shall be installed in accordance with the requirements of Chapter 3.

(2) Communications Raceways.

Low-power network-powered broadband communications cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways, selected in accordance with Table 800.154(b) , listed in accordance with 800.182, and installed in accordance with 800.113 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing apply.

(3) Innerduct for Low-Power Network-Powered Broadband Communications Cables.

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 800.154(b) shall be permitted to be installed as innerducts in any type of listed raceway permitted in Chapter 3.

(B) Raceway Fill for Network-Powered Broadband Communications Cables.

Raceway fill for network-powered broadband communications cables shall comply with either 830.100 (B)(1) or (B)(2).

(1) Low-Power Network-Powered Broadband Communications Cables.

The raceway fill requirements of Chapters 3 and 9 shall not apply to low-power network-powered broadband communications cables.

(2) Medium-Power Network-Powered Broadband Communications Cables.

Where medium-power network-powered broadband communications cables are installed in a raceway, the raceway fill requirements of Chapters 3 and 9 shall apply.

(C) Cable Routing Assemblies.

Low-power network-powered broadband communications cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 800.154(c) , listed in accordance with 800.182, and installed in accordance with 800.110(C) and 800.113.

(D) Cable Trays.

Network-powered broadband communications cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:

State:

Zip:

Submittal Date: Wed Jan 10 14:35:54 EST 2018

Committee Statement and Meeting Notes

Committee Statement: 830.110(A) pertains to raceways. The deleted text refers to cable routing assemblies, which are covered in 830.110(C), and was out of place in this paragraph.

New 830.110(D) is added because cable trays and cable routing assemblies perform similar functions. The code becomes more user-friendly if they are covered in the same section. The new requirement limits the allowance to metal and listed nonmetallic in order to address flame spread concerns. The title is revised to reflect this new content.

Response Message:

Public Input No. 86-NFPA 70-2017 [Section No. 830.110(A) [Excluding any Sub-Sections]]

Public Input No. 82-NFPA 70-2017 [Section No. 830.110]

Public Input No. 78-NFPA 70-2017 [New Section after 830.110(B)]

Editorial Comment

Click here

First Revision No. 7853-NFPA 70-2018 [Section No. 830.179 [Excluding any Sub-Sections]]

Network-powered broadband communications equipment and cables shall be listed and marked in accordance with 830.179(A) or (B). Network-powered broadband communications cables shall have a temperature rating of not less than 60°C (140°F). ~~Temperature~~ The temperature rating shall be marked on the jacket of network-powered broadband communications cables that have a temperature rating exceeding 60°C (140°F).

Exception No. 1: This listing requirement shall not apply to community antenna television and radio distribution system coaxial cables that were installed prior to January 1, 2000, in accordance with Article 820 and are used for low-power network-powered broadband communications circuits.

Exception No. 2: Substitute cables for network-powered broadband communications cables shall be permitted as shown in Table 830.154(b).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 15:18:30 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The panel revises the wording for clarity.
Response Message:

Public Input No. 166-NFPA 70-2017 [Section No. 830.179 [Excluding any Sub-Sections]]

First Revision No. 7854-NFPA 70-2018 [Section No. 840.2 [Excluding any Sub-Sections]]

The definitions in Part I of Article 100 ~~and 645.2~~ , 770.2, 800.2, and 820.2 shall apply. ~~For purposes of this article, the following additional definitions apply~~ The definitions in this section shall apply only within Article 840 .

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 15:44:58 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The definition of Information Technology Equipment has been moved from 645.2 to Article 100. Consequently, reference to 645.2 is no longer needed.

The revised text clarifies the applicability of the definitions contained in 800.2, as recommended by the NEC Correlating Committee Task Group.

Response Message:

Public Input No. 69-NFPA 70-2017 [Section No. 840.2 [Excluding any Sub-Sections]]

First Revision No. 7919-NFPA 70-2018 [Section No. 840.170(C)]

(C) Communications Equipment.

Communications equipment shall be listed in accordance with 800.170. ~~Premises communications wires and cables connecting to the network terminal shall be listed in accordance with~~ 800.179

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 10:12:15 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The deleted text is redundant as it is covered in 840.170(E).
Response Message:

Public Input No. 255-NFPA 70-2017 [Section No. 840.170(C)]

First Revision No. 7586-NFPA 70-2018 [New Section after 770.110(C)]

(D) Cable Trays.

Optical fiber cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 17:21:59 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Cable trays and cable routing assemblies perform similar functions. It makes the code more user-friendly if they are covered in the same section. The new requirement limits the allowance to metal and listed nonmetallic in order to address flame spread concerns.

Response Message:

Public Input No. 75-NFPA 70-2017 [New Section after 770.110(B)]

First Revision No. 7558-NFPA 70-2018 [Section No. 770.113(A)]

(A) Listing.

Optical fiber cables installed in buildings shall be listed in accordance with 770.179 and installed in accordance with the limitations of the listing .

Exception: Optical fiber cables that are installed in compliance with 770.48 shall not be required to be listed.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 14:22:14 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Listed optical fiber cables have a temperature rating that should not be exceeded.
Response Message:

Public Input No. 64-NFPA 70-2017 [New Section after 770.3(C)]

Editorial Comment

Click here

First Revision No. 7615-NFPA 70-2018 [Section No. 770.133(A)]

(A) With Conductors for Electric Light, Power, Class 1, Non–Power-Limited Fire Alarm, or Medium- Power Network-Powered Broadband Communications Circuits.

When optical fibers are within the same composite cable for electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuits operating at 1000 volts or less, they shall be permitted to be installed only where the functions of the optical fibers and the electrical conductors are associated.

~~Nonconductive~~ Conductive optical fiber cables contained in an armored or metal-clad–type sheath and nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non–power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operating at 1000 volts or less. Conductive optical fiber cables without an armored or metal-clad–type sheath shall not be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non–power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits.

Optical fibers in composite optical fiber cables containing only current-carrying conductors for electric light, power, or Class 1 circuits rated 1000 volts or less shall be permitted to occupy the same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with conductors for electric light, power, or Class 1 circuits operating at 1000 volts or less.

Nonconductive optical fiber cables shall not be permitted to occupy the same cabinet, outlet box, panel, or similar enclosure housing the electrical terminations of an electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuit.

Exception No. 1: Occupancy of the same cabinet, outlet box, panel, or similar enclosure shall be permitted where nonconductive optical fiber cable is functionally associated with the electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuit.

Exception No. 2: Occupancy of the same cabinet, outlet box, panel, or similar enclosure shall be permitted where nonconductive optical fiber cables are installed in factory- or field-assembled control centers.

Exception No. 3: In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installation, nonconductive optical fiber cables shall be permitted with circuits exceeding 1000 volts.

Exception No. 4: In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installation, optical fibers in composite optical fiber cables containing current-carrying conductors operating over 1000 volts shall be permitted to be installed.

Exception No. 5: Where all of the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from all of the optical fiber cables by a permanent barrier or listed divider.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 09:20:22 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Armored or metal clad sheath provides adequate separation of circuits.

Response Message:

Editorial Comment

Click here

First Revision No. 7656-NFPA 70-2018 [Section No. 800.2 [Excluding any Sub-Sections]]

See Part I of Article 100. ~~For the purposes of this article, the following additional definitions apply~~ The definitions in this section shall apply only within Article 800 .

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 13:00:21 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The revised text clarifies the applicability of the definitions contained in 800.2, as recommended by the NEC Correlating Committee Task Group.

Response Message:

Public Input No. 1976-NFPA 70-2017 [Section No. 800.2]

First Revision No. 7691-NFPA 70-2018 [New Section after 800.47(B)]

(C) On Mast.

Overhead (aerial) communications cables shall be permitted to be attached to an above-the-roof raceway mast that does not enclose or support conductors of electric light or power circuits.

(D) Between Buildings.

Communications cables extending between buildings or structures, and also the supports or attachment fixtures, shall be identified and shall have sufficient strength to withstand the loads to which they might be subjected.

Exception: Where a communications cable does not have sufficient strength to be self-supporting, it shall be attached to a supporting messenger wire that, together with the attachment fixtures or supports, has sufficient strength to withstand the loads to which they might be subjected.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 15:49:17 EST 2018

Committee Statement and Meeting Notes

Committee Statement: These additional requirements are consistent and correlate with similar requirements elsewhere in the Code.

Response Message:

Public Input No. 371-NFPA 70-2017 [New Section after 800.44(B)]

Public Input No. 370-NFPA 70-2017 [New Section after 800.44(B)]

First Revision No. 7713-NFPA 70-2018 [Section No. 800.90(A) [Excluding any Sub-Sections]]

A listed primary protector shall be provided on each circuit run partly or entirely in aerial wire or aerial cable not confined within a block. Also, a listed primary protector shall be provided on each circuit, aerial or underground, located within the block containing the building served so as to be exposed to accidental contact with electric light or power conductors operating at over 300 volts to ground. In addition, where there exists a lightning exposure, each interbuilding circuit on a premises shall be protected by a listed primary protector at each end of the interbuilding circuit. Installation of primary protectors shall also comply with 110.3(B).

Informational Note No. 1: On a circuit not exposed to accidental contact with power conductors, providing a listed primary protector in accordance with this article helps protect against other hazards, such as lightning and above-normal voltages induced by fault currents on power circuits in proximity to the communications circuit.

Informational Note No. 2: Interbuilding circuits are considered to have a lightning exposure unless one or more of the following conditions exist:

(1) Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning.

(2) Interbuilding cable runs of 42 m (140 ft) or less, directly buried or in underground conduit, where a continuous metallic cable shield or a continuous ~~metallic~~ metal conduit containing the cable is connected to each building grounding electrode system.

(3) Areas having an average of five or fewer thunderstorm days per year and earth resistivity of less than 100 ohm-meters. Such areas are found along the Pacific coast.

Informational Note No. 3: For information on lightning protection systems, see NFPA 780-~~2014~~ 2017 , *Standard for the Installation of Lightning Protection Systems.*

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 17:05:45 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The revision brings this section into compliance with the NEC Style Manual since you can't have an informational note to another informational note, and informational notes are required to follow the text to which they apply.

The reference to NFPA 780 is updated to the current edition.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 9, 2018	NEC-CMP Panel 16	Remove the indent on Informational Note No. 3. The item list above it is part of IN No. 2.

Public Input No. 2924-NFPA 70-2017 [Section No. 800.90]

Public Input No. 3456-NFPA 70-2017 [Section No. 800.90(A)]

First Revision No. 7786-NFPA 70-2018 [New Section after 800.179(G)]

(H) Types CMP-LP, CMR-LP, CMG-LP, and CM-LP Limited Power (LP) Cables.

Types CMP-LP, CMR-LP, CMG-LP, and CM-LP communications limited power cables shall be listed as suitable for carrying power and data up to a specified current limit for each conductor without exceeding the temperature rating of the cable where the cable is installed in cable bundles in free air or installed within a raceway, cable tray, or cable routing assembly. The cables shall be marked with the suffix "-LP(XXA)", where XX designates the current limit in amperes per conductor.

Informational Note: An example of the marking on a communications cable with an LP rating is "CMP-LP (0.6A)(75°C) 23AWG 4 pair," which indicates that it is a 4-pair plenum cable with 23 AWG conductors, a temperature rating of 75°C, and a current limit of 0.6 ampere.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 10:06:59 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Communications cables are already permitted as substitutes for Class 2 and Class 3 cables. LP cables are a specific type of Class 2, Class 3, and communications cable and do not affect the substitution hierarchy. The vast majority of LP cables are listed as communications cables. This revision recognizes these facts and explicitly permits these cable types as substitutes for Class 2 and Class 3 LP cables.

Response Message:

Public Input No. 415-NFPA 70-2017 [New Section after 800.179(G)]

Public Input No. 416-NFPA 70-2017 [Section No. 800.179 [Excluding any Sub-Sections]]

Editorial Comment

Click here

First Revision No. 8012-NFPA 70-2018 [Section No. 800.179 [Excluding any Sub-Sections]]

Communications wires and cables shall be listed in accordance with 800.179(A) through (~~I~~ J) and marked in accordance with Table 800.179. Conductors in communications cables, other than in a coaxial cable, shall be copper.

Communications wires and cables shall have a voltage rating of not less than 300 volts. The insulation for the individual conductors, other than the outer conductor of a coaxial cable, shall be rated for 300 volts minimum. The cable voltage rating shall not be marked on the cable or on the ~~undercarpet~~ under-carpet communications wire. Communications wires and cables shall have a temperature rating of not less than 60°C (140°F). The temperature rating shall be marked on the jacket of communications cables that have a temperature rating exceeding 60°C (140°F).

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

Informational Note: Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.

Table 800.179 Cable Markings

Cable Marking	Type
CMP	Communications plenum cable
CMR	Communications riser cable
CMG	Communications general-purpose cable
CM	Communications general-purpose cable
CMX	Communications cable, limited use
CMUC	Under-carpet communications wire and cable

Informational Note: Cable types are listed in descending order of fire ~~resistance rating~~ performance .

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 17:20:36 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Fire performance is the correct industry term.
Response Message:

Editorial Comment

Click here

First Revision No. 8014-NFPA 70-2018 [Section No. 800.182(A)]

(A) Plenum Cable Routing Assemblies and Plenum Communications Raceways.

Plenum cable routing assemblies and plenum communications raceways shall be listed as having adequate fire-resistant and low-smoke-producing characteristics.

Informational Note No. 1: One method of defining cable routing assemblies and communications raceways that have adequate fire-resistant and low-smoke-producing characteristics is that they exhibit a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84-~~15a~~ 17a , *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723-2013, *Standard Test Method for Surface Burning Characteristics of Building Materials*.

Informational Note No. 2: Another method of defining communications raceways that have adequate fire-resistant and low-smoke-producing characteristics is that they exhibit a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-2015, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*.

Informational Note No. 3: See ~~4.3.11.2.6 or 4.3.11.5.5 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on materials exposed to the airflow in ceiling cavity and raised floor plenums.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 17:24:49 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The references to ASTM E84 and NFPA 90A are updated to the current editions.
Response Message:

First Revision No. 7935-NFPA 70-2018 [Section No. 810.21(F)(2)]

(2) In Buildings or Structures with Grounding Means.

If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping systems, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to the building, as covered in 250.94

(4) The nonflexible ~~metallic~~ metal power service raceway

(5) The service equipment enclosure, or

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosures of the power service

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 10:54:42 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

Response Message:

Public Input No. 2926-NFPA 70-2017 [Section No. 810.21(F)]

Editorial Comment

Click here

First Revision No. 7943-NFPA 70-2018 [Section No. 820.2 [Excluding any Sub-Sections]]

See Part I of Article 100. ~~For the purposes of this article, the following additional definitions apply~~ The definitions in this section shall apply only within Article 820 .

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:16:27 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The revised text clarifies the applicability of the definitions contained in 820.2, as recommended by the NEC Correlating Committee Task Group.

Response Message:

Public Input No. 1977-NFPA 70-2017 [Section No. 820.2]

First Revision No. 7944-NFPA 70-2018 [Section No. 820.3 [Excluding any Sub-Sections]]

Circuits and equipment shall comply with 820.3(A) through ~~820.3(I)~~ (I) . Only those sections of Chapters 1 through 7 referenced in Article 820 shall apply to community antenna television and radio distribution systems.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:22:03 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The new text is added to reinforce the independence of Article 820.
Response Message:

Public Input No. 1738-NFPA 70-2017 [Section No. 820.3]

First Revision No. 7946-NFPA 70-2018 [New Section after 820.26]

820.27 Temperature Limitations of Wires and Cables.

No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:26:43 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The new text simplifies the Code by including the requirement in Article 820, rather than a cross-reference.

Response Message:

Public Input No. 67-NFPA 70-2017 [New Section after 820.3(I)]

First Revision No. 7949-NFPA 70-2018 [Section No. 820.100(B)(2)]

(2) In Buildings or Structures with Grounding Means.

If an intersystem bonding termination is established, 250.94(A) shall apply.

If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible ~~metallic~~ metal power service raceway

(5) The service equipment enclosure

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is connected to an electrode as covered in 250.32

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.

For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 820.93, shall be considered accessible.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 11:45:02 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

Response Message:

Public Input No. 2927-NFPA 70-2017 [Section No. 820.100(B)]

First Revision No. 7956-NFPA 70-2018 [Sections 820.113(B), 820.113(C)]

(B) Ducts Specifically Fabricated for Environmental Air.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(1) Up to 1.22 m (4 ft) of Type CATVP

(2) Types CATVP, CATVR, CATV, and CATVX installed in raceways that are installed in compliance with 300.22(B)

Informational Note: For information on fire protection of wiring installed in fabricated ducts, see ~~4.3.4.1 and 4.3.11.3.3 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

(C) Other Spaces Used For Environmental Air (Plenums).

The following cables shall be permitted in other spaces used for environmental air (plenums) as described in 300.22(C):

(1) Type CATVP

(2) Type CATVP installed in plenum communications raceways

(3) Type CATVP installed in plenum cable routing assemblies

(4) Type CATVP supported by open ~~metallic~~ metal cable ~~trays or cable~~ tray systems

(5) Types CATVP, CATVR, CATV, and CATVX installed in raceways that are installed in compliance with 300.22(C)

(6) Types CATVP, CATVR, CATV, and CATVX supported by solid-bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

(7) Types CATVP, CATVR, CATV, and CATVX installed in plenum communications raceways, riser communications raceways, or general-purpose communications raceways supported by solid-bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

Informational Note: For information on fire protection of wiring installed in other spaces used for environmental air (plenums) , see ~~4.3.11.2, 4.3.11.4, and 4.3.11.5 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

Submitter Information Verification

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Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

"Cable trays" is deleted from (C)(4) as "cable tray systems" is the broader term.

The references to NFPA 90A were updated to the current edition.

Response Message:

Public Input No. 111-NFPA 70-2017 [Section No. 820.113(B)]

Public Input No. 116-NFPA 70-2017 [Section No. 820.113(C)]

Editorial Comment

Click here

First Revision No. 7829-NFPA 70-2018 [Section No. 820.154]

820.154 Applications of Listed CATV Cables.

Permitted and nonpermitted applications of listed coaxial cables shall be as indicated in Table 820.154(a). The permitted applications shall be subject to the installation requirements of 820.110 and 820.113. The substitutions for coaxial cables in Table 820.154(b) and illustrated in Figure 820.154 shall be permitted.

Informational Note: The substitute cables in Table 820.154(b) and Figure 820.154 are only coaxial-type cables.

Table 820.154(a) Applications of Listed Coaxial Cables in Buildings

Applications		Listed Coaxial Cable Type			
		CATVP	CATVR	CATV	CATVX
In ducts specifically fabricated for environmental air as described in 300.22(B)	In fabricated ducts as described in 300.22(B)	Y*	N	N	N
	In metal raceway that complies with 300.22(B)	Y*	Y*	Y*	Y*
In other spaces used for environmental air (plenums) as described in 300.22(C)	In other spaces used for environmental air (plenums) as described in 300.22(C)	Y*	N	N	N
	In metal raceway that complies with 300.22(C)	Y*	Y*	Y*	Y*
	In plenum communications raceways	Y*	N	N	N
	In plenum cable routing assemblies	Y*	N	N	N
	Supported by open metal cable trays	Y*	N	N	N
	Supported by solid-bottom metal cable trays with solid metal covers	Y*	Y*	Y*	Y*
In risers	In vertical runs	Y*	Y*	N	N
	In metal raceways	Y*	Y*	Y*	Y*
	In fireproof shafts	Y*	Y*	Y*	Y*
	In plenum communications raceways	Y*	Y*	N	N
	In plenum cable routing assemblies	Y*	Y*	N	N
	In riser communications raceways	Y*	Y*	N	N
	In riser cable routing assemblies	Y*	Y*	N	N
	In one- and two-family dwellings	Y*	Y*	Y*	Y*
Within buildings in other than air-handling spaces and risers	General	Y*	Y*	Y*	Y*
	In one- and two-family dwellings	Y*	Y*	Y*	Y*
	In multifamily dwellings	Y*	Y*	Y*	Y*
	In nonconcealed spaces	Y*	Y*	Y*	Y*
	Supported by cable trays	Y*	Y*	Y*	N
	In distributing frames and cross-connect arrays	Y*	Y*	Y*	N
	In any raceway recognized in Chapter 3	Y*	Y*	Y*	Y*
	In plenum communications raceways	Y*	Y*	Y*	N
	In plenum cable routing assemblies	Y*	Y*	Y*	N
	In riser communications raceways	Y*	Y*	Y*	N
	In riser cable routing assemblies	Y*	Y*	Y*	N
	In general-purpose communications raceways	Y*	Y*	Y*	N
	In general-purpose cable routing assemblies	Y*	Y*	Y*	N

Note: An “N” in the table indicates that the cable type ~~is~~ shall not be permitted to be installed in the

application. A “Y*” indicates that the cable type ~~is~~ shall be permitted to be installed in the application, subject to the limitations described in 820.113.

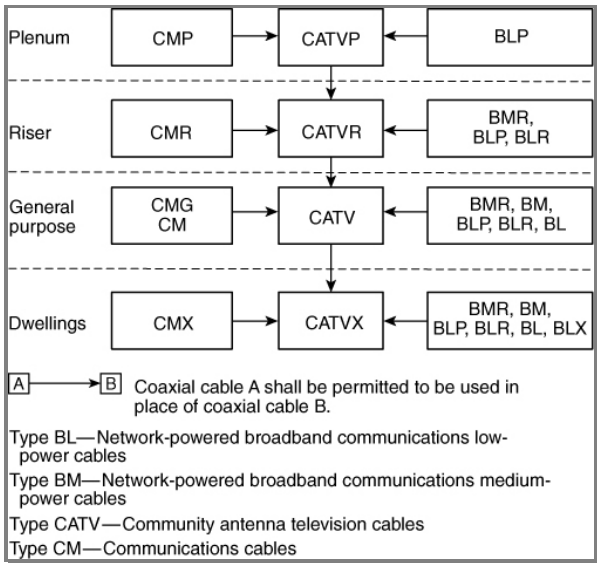
Informational Note No. 1: Part V of Article 820 covers installation methods within buildings. This table covers the applications of listed coaxial cables in buildings. The definition of *Point of Entrance* is in 820.2.

Informational Note No. 2: For information on the restrictions to the installation of communications cables in ducts specifically fabricated for environmental air, see 820.113(B).

Table 820.154(b) Coaxial Cable Uses and Permitted Substitutions

Cable Type	Permitted Substitutions
CATVP	CMP, BLP
CATVR	CATVP, CMP, CMR, BMR, BLP, BLR
CATV	CATVP, CMP, CATVR, CMR, CMG, CM, BMR, BM, BLP, BLR, BL
CATVX	CATVP, CMP, CATVR, CMR, CATV, CMG, CM, BMR, BM, BLP, BLR, BL, BLX

Figure 820.154 Cable Substitution Hierarchy.



Supplemental Information

File Name	Description	Approved
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Submittal Date: Wed Jan 10 13:33:29 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The revised note following Table 820.154(a) correlates with the similar notes in other 8XX.154 tables.
Response Message:

Public Input No. 142-NFPA 70-2017 [Section No. 820.154]

Editorial Comment

Click here

First Revision No. 8016-NFPA 70-2018 [Section No. 820.179(D)]

(D) Type CATVX.

Type CATVX limited-use community antenna television coaxial cables shall be listed as being suitable for use in dwellings and for use in raceways and shall also be listed as being resistant to flame spread.

Informational Note: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-~~2013~~ 2017 , *Reference Standard for Electrical Wires, Cables and Flexible Cords*.

Table 820.179 Coaxial Cable Markings

Cable Marking	Type
CATVP	CATV plenum cable
CATVR	CATV riser cable
CATV	CATV cable
CATVX	CATV cable, limited use

Informational Note: Cable types are listed in descending order of fire ~~resistance rating~~ performance .

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Committee Statement and Meeting Notes

Committee Statement: The reference to UL 1581 is updated to the current edition.

Fire performance is the correct industry term.

Response Message:

First Revision No. 7803-NFPA 70-2018 [Section No. 830.2 [Excluding any Sub-Sections]]

See Part I of Article 100. ~~For purposes of this article, the following additional definitions apply~~ The definitions in this section shall apply only within Article 830 .

Informational Note: A typical single-family network-powered communications circuit consists of a communications drop or communications service cable and an NIU and includes the communications utility's serving terminal or tap where it is not under the exclusive control of the communications utility.

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Committee Statement and Meeting Notes

Committee Statement: The revised text clarifies the applicability of the definitions contained in 830.2, as recommended by the NEC Correlating Committee Task Group.

Response Message:

Public Input No. 1979-NFPA 70-2017 [Section No. 830.2]

First Revision No. 7813-NFPA 70-2018 [Section No. 830.3 [Excluding any Sub-Sections]]

Circuits and equipment shall comply with 830.3(A) through (~~G~~ F). Only those sections of Chapters 1 through 7 referenced in Article 830 shall apply to communications circuits and equipment.

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Committee Statement and Meeting Notes

Committee Statement: The cross-reference is updated as there is no (G).

The new text is added to reinforce the independence of Article 830.

Response Message:

Public Input No. 1739-NFPA 70-2017 [Section No. 830.3]

First Revision No. 7816-NFPA 70-2018 [New Section after 830.26]

830.27 Temperature Limitations of Wires and Cables.

No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.

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Submitter Full Name: NEC-CMP Panel 16
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Committee Statement and Meeting Notes

Committee Statement: The new text simplifies the Code by including the requirement in Article 830, rather than a cross-reference.

Response Message:

Public Input No. 68-NFPA 70-2017 [New Section after 830.3(F)]

Editorial Comment

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First Revision No. 7833-NFPA 70-2018 [Section No. 830.47(C)]

(C) ~~Mechanical~~ Protection from Physical Damage .

Direct-buried cable, conduit, or other raceways shall be installed to meet the minimum cover requirements of Table 830.47(C). In addition, direct-buried cables emerging from the ground shall be protected by enclosures, raceways, or other approved means extending from the minimum cover distance required by Table 830.47(C) below grade to a point at least 2.5 m (8 ft) above finished grade. In no case shall the protection be required to exceed 450 mm (18 in.) below finished grade. Types BMU and BLU direct-buried cables emerging from the ground shall be installed in rigid metal conduit (RMC), intermediate metal conduit (IMC), rigid nonmetallic conduit, or other approved means extending from the minimum cover distance required by Table 830.47(C) below grade to the point of entrance.

Exception: A low-power network-powered broadband communications circuit that is equipped with a listed fault protection device, appropriate to the network-powered broadband communications cable used, and located on the network side of the network-powered broadband communications cable being protected.

Table 830.47(C) Network-Powered Broadband Communications Systems Minimum Cover Requirements (*Cover* is the shortest distance measured between a point on the top surface of any direct-buried cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.)

Location of Wiring Method or Circuit	Direct Burial Cables		Rigid Metal Conduit (RMC) or Intermediate Metal Conduit (IMC)		Nonmetallic Raceways Listed for Direct Burial; Without Concrete Encasement or Other Approved Raceways	
	mm	in.	mm	in.	mm	in.
All locations not specified below	450	18	150	6	300	12
In trench below 50-mm (2-in.) thick concrete or equivalent	300	12	150	6	150	6
Under a building (in raceway only)	0	0	0	0	0	0
Under minimum of 100-mm (4-in.) thick concrete exterior slab with no vehicular traffic and the slab extending not less than 150 mm (6 in.) beyond the underground installation	300	12	100	4	100	4
One- and two-family dwelling driveways and outdoor parking areas and used only for dwelling-related purposes	300	12	300	12	300	12

Notes:

1. Raceways approved for burial only where concrete encased shall require a concrete envelope not less than 50 mm (2 in.) thick.

2. Lesser depths shall be permitted where cables rise for terminations or splices or where access is otherwise required.

3. Where solid rock is encountered, all wiring shall be installed in metal or nonmetallic raceway permitted for direct burial.

The raceways shall be covered by a minimum of 50 mm (2 in.) of concrete extending down to rock.

4. Low-power network-powered broadband communications circuits using directly buried community antenna television and radio distribution system coaxial cables that were installed outside and entering buildings prior to January 1, 2000, in accordance with Article 820 shall be permitted where buried to a minimum depth of 300 mm (12 in.).

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Committee Statement and Meeting Notes

Committee Statement: The panel revises the title to comply with Style Manual and other times the code mentions protection from damage.

Response Message:

Public Input No. 3697-NFPA 70-2017 [New Section after 830.47(C)]

Editorial Comment

Click here

First Revision No. 7841-NFPA 70-2018 [Section No. 830.100(B)]

(B) Electrode.

The bonding conductor or grounding electrode conductor shall be connected in accordance with 830.100(B)(1), ~~830.100(B)(2)~~ (B)(2) , or ~~830.100(B)(3)~~ (B)(3) .

(1) In Buildings or Structures with an Intersystem Bonding Termination.

If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.

Informational Note: See Informational Note Figure 800.100(B)(1) for an illustration of the application of the bonding conductor in buildings and structures equipped with an intersystem bonding termination.

(2) In Buildings or Structures with Grounding Means.

If an intersystem bonding termination is established, 250.94(A) shall apply.

If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on one of the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures using the options identified in 250.94(A), Exception

(4) The nonflexible ~~metallic~~ metal power service raceway

(5) The service equipment enclosure

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is connected to an electrode as covered in 250.32

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on nonremovable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is nonremovable.

Informational Note: See Informational Note Informational Note Figure 800.100(B)(2) for an illustration of the application of the bonding conductor in buildings and structures not equipped with an intersystem bonding termination or terminating block providing access to the building grounding electrode system.

For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 830.93, shall be considered accessible.

(3) In Buildings or Structures Without an Intersystem Bonding Termination or Grounding Means.

If the building or structure served has no intersystem bonding termination or grounding means, as described in 830.100(B)(2), the grounding electrode conductor shall be connected to either of the following:

(1) To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or (A)(4).

(2) If the building or structure served has no intersystem bonding termination or has no grounding means, as described in 830.100(B)(2) or (B)(3)(1), to any one of the individual grounding electrodes described in 250.52(A)(7) and (A)(8), or to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (½ in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning conductors as covered in 800.53 and at least 1.8 m (6 ft) from electrodes of other systems. Steam, hot water pipes, or lightning-protection system conductors shall not be employed as grounding electrodes for protectors, NIUs with integral protection, grounded ~~metallic~~ metal members, NIUs with metallic enclosures, and other equipment.

Supplemental Information

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Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

The new informational notes, referencing the figure Section 800.1, will closely associate the informational note with the requirement to which it pertains. The original placement, at the beginning of Article 830, created a "floating" informational note that was not directly associated with a specific requirement.

Response Message:

Public Input No. 2930-NFPA 70-2017 [Section No. 830.100(B)]

Public Input No. 901-NFPA 70-2017 [Section No. 830.100(B)(1)]

Public Input No. 902-NFPA 70-2017 [Section No. 830.100(B)(2)]

Editorial Comment

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First Revision No. 7850-NFPA 70-2018 [Sections 830.113(B), 830.113(C)]

(B) Ducts Specifically Fabricated for Environmental Air.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(1) Up to 1.22 m (4 ft) of Type BLP

(2) Types BLP, BMR, BLR, BM, BL, and BLX installed in raceways that are installed in compliance with 300.22(B)

Informational Note: For information on fire protection of wiring installed in fabricated ducts, see ~~4.3.4.1 and 4.3.11.3.3 in~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

(C) Other Spaces Used For Environmental Air (Plenums).

The following cables shall be permitted in other spaces used for environmental air (plenums) as described in 300.22(C):

(1) Type BLP

(2) Type BLP installed in plenum communications raceways

(3) Type BLP installed in plenum cable routing assemblies

(4) Type BLP supported by open ~~metallic~~ metal cable ~~trays or cable~~ tray systems

(5) Types BLP, BMR, BLR, BM, BL, and BLX installed in raceways that are installed in compliance with 300.22(C)

(6) Types BLP, BMR, BLR, BM, BL, and BLX supported by solid-bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

(7) Types BLP, BLR, BM, BL, and BLX installed in plenum communications raceways, riser communications raceways, or general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

Informational Note: For information on fire protection of wiring installed in other spaces used for environmental air (plenums) , see ~~4.3.11.2, 4.3.11.4, and 4.3.11.5 of~~ NFPA 90A-~~2015~~ 2018 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

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Submittal Date: Wed Jan 10 15:00:23 EST 2018

Committee Statement and Meeting Notes

Committee Statement: "Metal" is the correct term when referring to a solid hard material that is malleable, fusible, ductile, and has good electrical and thermal conductivity. "Metallic" describes a material that may consist or contain metal such as metal flake paint; it is the incorrect term for the purpose of describing material used with raceways, gutters, etc. in the National Electrical Code.

"Cable trays" is deleted from (C)(4) as "cable tray systems" is the broader term.

The references to NFPA 90A are updated to the current edition.

Response Message:

Public Input No. 113-NFPA 70-2017 [Section No. 830.113(B)]

Public Input No. 117-NFPA 70-2017 [Section No. 830.113(C)]

Editorial Comment

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First Revision No. 7856-NFPA 70-2018 [New Definition after Definition: Network Terminal.]

Broadband.

Wide bandwidth data transmission that transports multiple signals, protocols, and traffic types over various media types.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
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Committee Statement and Meeting Notes

Committee Statement: A definition for the term broadband is added to provide an appropriate description of the circuits covered under Article 840.
Response Message:

Editorial Comment

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First Revision No. 7859-NFPA 70-2018 [New Definition after Definition: Premises Community Antenna...]

Premises-Powered.

Using power provided locally from the premises.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
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Committee Statement and Meeting Notes

Committee Statement: The term “premises-powered” is defined as it now applies to more than one type of system.

Response Message:

Public Input No. 3726-NFPA 70-2017 [New Section after 840.2]

First Revision No. 7862-NFPA 70-2018 [New Definition after Definition: Premises Community Antenna...]

Communications Service Provider.

An organization, business, or individual that offers communications service to others.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
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Street Address:
City:
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Committee Statement and Meeting Notes

Committee Statement: The term “communications service provider” is introduced in Articles 800, 830, and 840.

Response Message:

Public Input No. 4238-NFPA 70-2017 [New Section after 840.2]

Editorial Comment

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First Revision No. 7887-NFPA 70-2018 [New Section after 840.26]

840.27 Temperature Limitations of Wires and Cables.

No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating.

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Committee Statement and Meeting Notes

Committee Statement: The new text simplifies the Code by including the requirement in Article 840, rather than a cross-reference.
Response Message:

First Revision No. 7888-NFPA 70-2018 [Section No. 840.44]

840.44 Overhead (Aerial) Optical Fiber Cables.

Overhead (aerial) optical fiber cables containing a non–current-carrying metallic member entering buildings shall comply with ~~840.44(A)~~ 770.44(A) and (B).

~~**(A)** On Poles and In-Span.~~

~~Where outside plant optical fiber cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 840.44(A)(1) through (A)(4) shall be met.~~

~~**(1)** Relative Location.~~

~~Where practicable, the outside plant optical fiber cables shall be located below the electric light or power conductors.~~

~~**(2)** Attachment to Cross-Arms.~~

~~Attachment of outside plant optical fiber cables to a cross-arm that carries electric light or power conductors shall not be permitted.~~

~~**(3)** Climbing Space.~~

~~The climbing space through outside plant optical fiber cables shall comply with the requirements of 225.14(D) .~~

~~**(4)** Clearance.~~

~~Supply service drops and sets of overhead service conductors of 0 to 750 volts running above and parallel to broadband communications service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of and at their attachment to the building. Clearance of not less than 1.0 m (40 in.) shall be maintained between the two services at the pole.~~

~~**(A)** Above Roofs.~~

~~Outside plant optical fiber cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.~~

~~*Exception No. 1: Vertical clearance requirements shall not apply to auxiliary buildings, such as garages and the like.*~~

~~*Exception No. 2: A reduction in clearance above only the overhanging portion of the roof, to not less than 450 mm (18 in.), shall be permitted if (a) not more than 1.2 m (4 ft) of premises-powered broadband communications service-drop cable passes above the roof overhang, and (b) the cable is terminated at a through- or above-the-roof raceway or approved support.*~~

~~*Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.*~~

~~Informational Note: For additional information regarding overhead wires and cables, see ANSI/IEEE C2-2012, *National Electrical Safety Code, Part 2, Safety Rules for Overhead Lines* .~~

Submitter Information Verification

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Committee Statement and Meeting Notes

Committee Statement: Section 840.44 became redundant when new (and identical) section 770.44 was created in the 2017 NEC. All the redundant text in 840.44 can now be eliminated by referring to 770.44.

Response Message:

Public Input No. 70-NFPA 70-2017 [Section No. 840.44]

First Revision No. 7889-NFPA 70-2018 [New Section after 840.93]

840.94 Premises Circuits Leaving the Building.

Where circuits leave the building to power equipment remote to the building or outside the exterior zone of protection defined by a 46 m (150 ft) radius rolling sphere, 800.90 and 800.93 shall apply.

Informational Note: See NFPA 780-2017, *Standard for the Installation of Lightning Protection Systems*, for the theory of the term *rolling sphere*.

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Committee Statement and Meeting Notes

Committee Statement: Circuits are being installed by utilities or service providers that provide power to exterior equipment. These circuits are derived from the premises power to avoid having to run copper cable to a location, establish a meter point, or provide batteries. Such circuits are potentially exposed to lightning events and/or electric power faults and require the same protection and grounding as other aerial, buried, or underground communications cables entering the building.

Response Message:

Public Input No. 1033-NFPA 70-2017 [New Section after 840.93(C)]

Editorial Comment

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First Revision No. 7891-NFPA 70-2018 [New Section after 840.101]

840.102 Premises Circuits Leaving the Building.

Where circuits leave the building to power equipment remote to the building or outside the exterior zone of protection defined by a 46 m (150 ft) radius rolling sphere, 800.100 and 800.106 shall apply.

Informational Note: See NFPA 780-2017, *Standard for the Installation of Lightning Protection Systems*, for the theory of the term *rolling sphere*.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 08:05:15 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Circuits are being installed by utilities or service providers that provide power to exterior equipment. These circuits are derived from the premises power to avoid having to run copper cable to a location, establish a meter point, or provide batteries. Such circuits are potentially exposed to lightning events and/or electric power faults and require the same protection and grounding as other aerial, buried, or underground communications cables entering the building.

Response Message:

Public Input No. 1032-NFPA 70-2017 [New Section after 840.101(C)]

Editorial Comment

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First Revision No. 7892-NFPA 70-2018 [Section No. 840.160]

840.160 Powering Circuits.

Communications cables listed in accordance with 800.179 , in addition to carrying the communications circuit, shall also be permitted to carry circuits for powering communications equipment. ~~Where the power supplied over a communications cable to communications equipment is greater than 60 watts, communication cables and the power circuit~~ listed in accordance with 800.170 . The power source shall be listed in accordance with 840.170(G) . Installation of the listed communications cables shall comply with 725.144 where communications cables are ~~used in place of~~ substituted for Class 2 and Class 3 cables in accordance with 725.154(A) .

Exception: Installing communications cables in compliance with 725.144 shall not be required for listed 4-pair communications cables where the rated current does not exceed 0.3 amperes in any conductor 24 AWG or larger.

Informational Note: A typical communications cable for this application is a 4-pair cable sometimes referred to as Category 5e (or higher) LAN cable or balanced twisted pair cable. These types of cables are often used to provide Ethernet- and Power over Ethernet (PoE)–type services. A large number of such powering cables bundled together can cause overheating of the wiring if not controlled as described in Table 725.144.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 11 08:15:24 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The existing text does not identify important listing requirements for communications cables, communications equipment, and powering equipment when associated with powering applications. The revised text clarifies that listing is an important safety requirement for the communications cables, the powered communications equipment and the power source in 840.160. The revised text provides improved distinction between powering applications associated with lower level communications applications and those powering applications appropriately covered in Article 725.

The existing text of 840.160 allows communications cables to be used in place of the Class 2 and Class 3 cables in 725.144. The revised text clarifies that these cable substitutions must comply with the existing cable substitution rules in 725.154(A). The existing text requires compliance with 725.144 when the power supplied is over 60W. Panel 16 based this on the assumption that the voltage was always 50 volts and all 8 conductors were used for the power as described in the Fact Finding Report on Power over Local Area Network Type Cables (4-Pair Data / Communications Cables).

The existing text would allow systems that deviate from these assumptions (e.g., supply 24 volts or supply only on 2 conductors) to operate with currents greater than 0.3 amperes per conductor, and possibly result in the overheating that 725.144 was meant to avoid. Additionally, the revised text clarifies that it is the cable installation that generally must comply with 725.144. The exception clearly states that deviation from wiring in accordance with 725.144 is only permitted for listed 4-pair communications cables, and only when the rated current does not exceed 0.3 amperes in any conductor.

The exception is based on the UL Fact-Finding investigation which showed that all the configurations tested did not exceed the cable temperature rating when all the conductors carried 0.3 A. 60 watts is equivalent to 0.3 A in a typical Power over Ethernet powering scheme when a 50 volt, 8 conductor power source is used. 24 AWG cables were tested in a wide variety of installation scenarios providing confidence that 0.3 amperes or less per conductor would not overheat cables. The data in the UL Fact-Finding Investigation does not support a broad exemption for cables smaller than 24 AWG or currents above 0.3 amperes.

The addition of the Informational Note assists the user with understanding the significance of the changes made to 840.160.

Response Message:

Public Input No. 3315-NFPA 70-2017 [Section No. 840.160]

Public Input No. 4101-NFPA 70-2017 [Section No. 840.160]

Public Input No. 1020-NFPA 70-2017 [Section No. 840.160]

Public Input No. 2664-NFPA 70-2017 [Section No. 800.1]

Public Input No. 3353-NFPA 70-2017 [Section No. 840.160]

Public Input No. 1923-NFPA 70-2017 [Section No. 840.160]

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