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Public Input	No. 3879-NFPA 70-2023 [ Definition: Cable Routing Assembly. ]
Cable Routing	J Assembly.
A single channe structural syste fiber cables, da equipment, Cla cables in plenu	el or connected multiple channels, as well as associated fittings, forming a m that is used to support and route communications wires and cables, optical ita cables associated with information technology and communications iss 2, Class 3, <u>Class 4,</u> and Type PLTC cables, and power-limited fire alarm m, riser, and general-purpose applications. (CMP-16)
Statement of Prob	elem and Substantiation for Public Input
Class 4 systems w installation of Class should have been Class 4 was added	rere designed to coexist with all these systems in a raceway. Article 722 governs the s 4 cables, as well and most of the other cables listed in this definition. Class 4 added for the 2023 code, it was an oversight to not correct this definition when d.
Submitter Full Na	me: Chad Jones
Organization:	Cisco Systems
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed Sep 06 08:55:32 EDT 2023
Committee:	NEC-P16
Committee Stater	nent
Resolution: FR-7	<u>'831-NFPA 70-2024</u>

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Public Input N	lo. 3378-NFPA 70-2023 [ Definition: Con	nmunications Circuit. ]
Communicatio	ns Circuit.	
A metallic, fiber, communications	or wireless circuit that provides voice/data (and as -related services between communications equipm	sociated power) for ent. (CMP-16)
Informational No possible that a c Power over Ethe communications circuit is not inte	te: Because communications can be carried over or ircuit can meet both this definition and the definition rnet is also meets the definition of a Class 2 circuit device may be used on a branch circuit). The addi inded to change the treatment of the circuit in this c	<u>conductors with power, it is</u> n for a powering circuit (e.g., <u>and a power line</u> tion of data to a powering ode.
atement of Probl	em and Substantiation for Public Input	
has made it possible Power over Etherne with sales of well ov devices, usually cor home computer net for confusion betwe chapter 3 for branch rules. The informati circuits to communio A related PI makes	e for premises circuits to be both communications of t (PoE), and Powerline communications (PLC) dev er millions of units per year. These are largely con mecting devices on premises, such as security sys works. The expansion of the definition of communi en these power circuits, treated elsewhere in the co or circuits with PLC), resulting in possible ignorance onal note adds clarity that it is not the intent to allow cations circuits.	circuits and powering circuits. rices are commonplace, both isumer or integrator installed tems, cameras, or extending cations circuit creates potential ode (e.g., chapter 7 for PoE, or or avoidance of the appropriate w the conversion of power
lated Public Inpu	its for This Document	
	Related Input	Relationship
Public Input No. 33	82-NFPA 70-2023 [New Section after 800.3( <u>H</u> )]	Related Code
Public Input No. 33	82-NFPA 70-2023 [New Section after 800.3(H)]	
bmitter Informat	ion Verification	
Submitter Full Nam	ne: George Zimmerman	
Organization:	CME Consulting, Inc.	
Affiliation:	self	
Street Address:		
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Zip:		
Submittal Date:	Fri Sep 01 15:49:52 EDT 2023	
Committee:	NEC-P16	
mmittee Stateme	ent	
Resolution: FR-78	34-NFPA 70-2024	
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**Statement:** The informational note adds clarity that the conversion of power circuits to communications circuits is not allowed.

<del>Innerauct</del> Inne	r-Duct .
A nonmetallic ra	ceway placed within a larger raceway. (CMP-16)
Statement of Probl	em and Substantiation for Public Input
"Innerduct" is not fo major electrical mar inform dictionary pu corrected to "inner-	ound in any dictionary of any English variant, so it is not a word in English. However, nufacturers do spell it that way. So, it is the responsibility of the electrical industry to iblishers that the word "innerduct" exists in English, or else the spelling should be duct" in the National Electric Code.
Submitter Informat	tion Verification
Submitter Full Nan	ne: Conrad Ko
Organization:	[ Not Specified ]
Organization: Street Address:	[ Not Specified ]
Organization: Street Address: City:	[Not Specified ]
Organization: Street Address: City: State:	[Not Specified ]
Organization: Street Address: City: State: Zip:	[Not Specified ]
Organization: Street Address: City: State: Zip: Submittal Date:	[ Not Specified ] Wed Apr 26 01:16:06 EDT 2023
Organization: Street Address: City: State: Zip: Submittal Date: Committee:	[ Not Specified ] Wed Apr 26 01:16:06 EDT 2023 NEC-P16

Public Ir	put No. 902-NFPA 70-2023 [ Definition: Point of Entrance. ]
Point of	Entrance.
The point wall, from	within a building at which <del>the</del> <u>a</u> wire <u>, raceway,</u> or cable emerges from an external the roof, or <del>from a concrete</del> floor- <del>slab</del> . (CMP-16)
Statement of	Problem and Substantiation for Public Input
Not all floors because (as the context o long as they	are concrete slabs. More importantly, however, this definition needs to be changed of 2023) it no longer applies only to limited-energy systems. This definition now applies in f 230.70, so it could be argued that service conductors are now allowed in buildings as are in a raceway. That has been prohibited in the NEC for over 120 years.
Submitter Info	ormation Verification
Submitter Fu	III Name: Ryan Jackson
Organizatior	I: Self-employed
Affiliation:	Steel Tube Institute
Street Addre	SS:
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State:	
ZIP:	Sun May 29, 11:24:15 EDT 2022
Committee:	NEC-P16
Committee.	
Committee St	atement
Resolution:	FR-7838-NFPA 70-2024
Statement:	The term concrete is removed since not all floors are concrete slabs. The term raceway has not been added to avoid conflict with 800.48, which permits the extension of the poir

Public II NFPA (Communicat	nput No. 3878-NFPA 70-2023 [ Definition: Raceway, Communications. ions Racewa ]
Raceway	v. Communications. (Communications Raceway)
An enclos wires and communi limited fir	sed channel of nonmetallic materials designed expressly for holding communications I cables; optical fiber cables; data cables associated with information technology and cations equipment; Class 2, Class 3, <u>Class 4</u> , and Type PLTC cables; and power- e alarm cables in plenum, riser, and general-purpose applications. (CMP-16)
Statement of	Problem and Substantiation for Public Input
Class 4 syste installation o should have Class 4 was Submitter Infe	ems were designed to coexist with all these systems in a raceway. Article 722 governs the f Class 4 cables, as well and most of the other cables listed in this definition. Class 4 been added for the 2023 code, it was an oversight to not correct this definition when added.
Submitter F	ull Name: Chad Jones
Organization Street Addre	n: Cisco Systems
City: State: Zip:	
Submittal D Committee:	ate: Wed Sep 06 08:48:20 EDT 2023 NEC-P16
Committee St	atement
Resolution:	FR-7844-NFPA 70-2024
Statement:	The term Class 4 is added since Class 4 systems are designed to be installed with the other cables identified in the definition.

in the for point or	m of a digital bitstream or a digitiz	ns): The transfer and reception of information red analog signal transmitted over a point-to- CMP-16)
atement of I	Problem and Substantiation	for Public Input
A definition of communication	data communications is needed to cons. This definition is also the founda	define that it is part of the larger term of tion of several related PIs to reduce ambiguity.
elated Public	c Inputs for This Document	
	Related Input	<u>Relationship</u>
Public Input	<u>No. 4281-NFPA 70-2023 [Section No</u> No. 4285-NEPA 70-2023 [Section No	<u>). 800.1]</u> 2725.60(A)]
ubmittor Info	ermation Varification	<u>····20.00(1)</u> j
Submitter Fu	Ill Name: Stanley Kaufman	
Organization	: CableSafe, Inc./OFS	
Street Addre	55.	
State:		
State: Zip:		
State: Zip: Submittal Da	te: Thu Sep 07 09:19:11 EDT :	2023

# Public Input No. 3336-NFPA 70-2023 [New Definition after Definition:

## Communications Equipment.]

#### **Communications Service Point.**

<u>The point of connection between the communications service provider's network (Outside Plant)</u> and the premises wiring (Inside Plant). (CMP-XX)

## **Statement of Problem and Substantiation for Public Input**

This public input is a follow up to work performed in the 2023 code cycle by a Task Group chartered by the chair of the NEC AAC to consider correlation issues between chapters 7 and 8. The work is being resubmitted to align with limited energy reorganization recommendations made in this code cycle through new correlating committee Task Groups. By identifying the communications service point, analogous to the electrical service point, the domain of the communications circuits in chapter 8 become more clearly inspectable. The definition of communications circuit in chapter 8 extends service from the communications, outside plant refers to all of the physical cabling and supporting infrastructure (such as conduit, cabinets, tower or poles), and any associated hardware (such as repeaters) located between a demarcation point in a switching facility and a demarcation point in another switching center or customer premises. The term "outside plant communications cable" is also used in 805.48 to distinguish cable coming from the service provider. Depending on the type of communications service, the communications point may take several forms, and the requirements for these are detailed in a proposed new section, in a related PI.

Relationship

## **Related Public Inputs for This Document**

Related Input
Public Input No. 3337-NFPA 70-2023 [New Section after 800.44]

## **Submitter Information Verification**

Submitter Full Name: George ZimmermanOrganization:CME Consulting, Inc.Affiliation:(self)Street Address:City:State:State:Zip:Fri Sep 01 13:03:22 EDT 2023Committee:NEC-P16

## **Committee Statement**

**Resolution:** <u>FR-7847-NFPA 70-2024</u>

**Statement:** The definition has been created to distinguish communications service point from the other service points identified in the code.

Public li	nput No. 4290-NFPA 70-2023 [ New Definition after Definition:
Communicati	ons Equipment. ]
<u>Commune manual a</u> receptio	nications System: The communications equipment, communication circuits and and machine operations necessary for the transmission, movement, and n of information (e.g., voice, audio, video, data). (CMP-16)
Statement of This PI addre within multip Submitter Infe	Problem and Substantiation for Public Input esses that "communication systems" is not defined within the NEC, but the terms is used e articles, including the title of Article 800.
Submitter F Organization Street Addre City: State: Zip:	ull Name: Stanley Kaufman n: CableSafe, Inc./OFS ess:
Submittal D Committee:	ate: Thu Sep 07 09:31:00 EDT 2023 NEC-P16
Committee St	atement
Resolution: Statement:	<u>FR-7851-NFPA 70-2024</u> The term communication systems has been used in the past to refer to only audio. This definition includes video and data as communication mediums which aligns with its use in the code.



Ctus at A dalar	
Street Addre	55:
City:	
State:	
Zip:	
Submittal Da	ate: Fri Mar 17 12:27:36 EDT 2023
Committee:	NEC-P16
Committee St	atement
<b>Resolution:</b>	FR-7854-NFPA 70-2024
Statement:	This new definition further identifies the difference between a communications utility and a communication service provider. This revision also aligns with the definition for utility, in NFPA 76.

Public II	nput No. 4049-NFPA 70-2023 [ New Definition after Definition:
Commun	ications System:
The comm	nunications equipment, communication circuits and manual and machine operations necessary
for the tra	nsmission, movement, and reception of information (e.g., voice, audio, video, data). (CMP-16)
Statement of This PI addre	<b>Problem and Substantiation for Public Input</b> esses that "communication systems" is not defined within the NEC, but the terms is used le articles, including the title of Article 800
Submitter Inf	ormation Verification
Organizatio	n: Bicsi
Street Addre	ess:
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State:	
Zip:	
Submittal D	ate: Wed Sep 06 14:57:34 EDT 2023
Committee:	NEC-P16
Committee St	tatement
	FR-7851-NFPA 70-2024
<b>Resolution:</b>	

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Data Communica	ations
The transfer and transmitted over	reception of information in the form of a digital bitstream or a digitized analog signal a point-to-point or point-to-multipoint arrangement. (CMP-16)
atement of Prob	em and Substantiation for Public Input
A definition of data communications. Th ambiguity.	communications is needed to define that it is part of the larger term of his definition is also the foundation of several additional PIs introduced to reduce
lated Public Inp	uts for This Document
Public Input No. 40	Related Input         Relationship           068-NFPA 70-2023 [Section No. 800.1]
Ibmitter Informat	tion Verification
Submitter Full Nar	ne: Jeff Silveira
Organization:	Bicsi
Street Address:	
Street Address: City: State:	
Street Address: City: State: Zip:	
Street Address: City: State: Zip: Submittal Date:	Wed Sep 06 15:29:42 EDT 2023
Street Address: City: State: Zip: Submittal Date: Committee:	Wed Sep 06 15:29:42 EDT 2023 NEC-P16
Street Address: City: State: Zip: Submittal Date: Committee:	Wed Sep 06 15:29:42 EDT 2023 NEC-P16 ent
Street Address: City: State: Zip: Submittal Date: Committee: Dommittee Statem Resolution: <u>FR-78</u>	Wed Sep 06 15:29:42 EDT 2023 NEC-P16 ent 345-NFPA 70-2024

Public Input N	o. 3329-NFPA 70-2023 [ New Definition after Definition:
Outside Plant for	Communications
<u>Equipment, cable</u> <u>communications</u> <u>building.</u>	es and supporting infrastructure located from the first manhole or pole outside the central office or switching center to the network service point at the customer
Informational No. in Parts 2 and 3 of Informational No.	te 1: Further safety guidance and information on outside plant facilities is found of IEEE C2 (NESC) or the California General Orders (e.g., GO 95, GO 128). ote 2 : Communications facilities supplied by power utilities through metered
service points are	e covered by applicable sections of the NEC.
Additional Propose	d Changes
<u>File</u> Limited_Energy_TG	NameDescriptionApprovedSubstantiation.docx
Statement of Proble	em and Substantiation for Public Input
See attached docum	ient.
Submitter Informati	on Verification
Submitter Full Nam	e: g. Scott Harding
Organization: Street Address: City:	F.B. Harding, Inc.
State: Zip:	
Submittal Date: Committee:	Fri Sep 01 09:54:38 EDT 2023 NEC-P16
Committee Stateme	ent

**Resolution:** The term is not used in Chapter 8 and per the NFPA manual of style can not be defined.

## **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block





#### Article 3XX Optical Fiber Cables

<u>Part I. General</u>

<u>3XX.1 Scope.</u>

This article covers the installation of optical fiber cables. This article does not cover the construction of optical fiber cables.

3XX.3 Other Articles.

<u>Installations of optical fiber cables shall comply with 700.3(A) through (D). Only those sections of</u> <u>Chapter 2 and Article 300 referenced in this article shall apply to optical fiber cables.</u>

(1) <u>Hazardous (Classified) Locations.</u>

<u>Listed optical fiber cables shall be permitted to be installed in hazardous (classified) locations. The cables shall be sealed in accordance with 501.15, 502.15, or 505.16, as applicable.</u>

(1) Cables in Ducts for Dust, Loose Stock, or Vapor Removal.

The requirements of 300.22(A) for wiring systems shall apply to conductive optical fiber cables.

(1) <u>Hybrid Cables.</u>

<u>Hybrid optical fiber cables shall be classified as electrical cables in accordance with the type of electrical conductors. They shall be constructed, listed, and marked in accordance with the appropriate article for each type of electrical cable.</u>

(1) <u>Vertical Support for Fire-Resistive Cables.</u>

<u>Vertical installations of circuit integrity (CI) cables installed in a raceway or cables of fire-resistive</u> <u>cable systems shall be installed in accordance with their listing.</u>

<u>3XX.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.</u> <u>Access to</u> <u>electrical equipment shall not be denied by an accumulation of optical fiber cables that prevents</u> <u>removal of panels, including suspended ceiling panels.</u>

3XX.24 Mechanical Execution of Work.

(1) General.

<u>Optical fiber cables shall be installed in a neat and workmanlike manner. Cables installed exposed</u> 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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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.

Informational Note No. 1: See ANSI/NECA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables, 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, for accepted industry practices.

<u>Informational Note No. 2: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning</u> <u>and Ventilating Systems</u>, 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.

(1) <u>Circuit Integrity (CI) Cable.</u>

<u>Circuit integrity (CI) cable shall be supported at a distance not exceeding 610 mm (24 in.). Cable shall be secured to the noncombustible surface of the building structure. Cable supports and fasteners shall be steel.</u>

3XX.25 Abandoned Cables.

The accessible portion of abandoned optical fiber 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.

3XX.26 Spread of Fire or Products of Combustion.

<u>Installations of optical fiber cables and communications raceways in hollow spaces, vertical shafts,</u> 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 optical fiber 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 770.26 can be found in building codes, fire resistance directories, and product listings.

3XX.27 Temperature Limitation of Optical Fiber Cables.

<u>Optical fiber cable shall not be used in such a manner that its operating temperature exceeds that of its rating.</u>

Part II. Cables Outside and Entering Buildings

3XX.44 Overhead (Aerial) Optical Fiber Cables.

<u>Overhead optical fiber cables containing a non-current-carrying metallic member entering buildings shall comply with 800.44(A) and (B).</u>

(1) On Poles and In-Span.

<u>Where outside plant optical fiber cables and electric light or power conductors are supported by</u> the same pole or are run parallel to each other in-span, the conditions described in 3XX.44(A) (1) through (A)(4) shall be met.

(1) <u>Relative Location.</u>

<u>Where practicable, the outside plant optical fiber cables shall be located below the electric light or power conductors.</u>

(1) Attachment to Cross-Arms.

<u>Attachment of outside plant optical fiber cables to a cross-arm that carries electric light or power</u> <u>conductors shall not be permitted.</u>

(1) <u>Climbing Space.</u>

<u>The climbing space through outside plant optical fiber cables shall comply with the requirements of 225.14(B).</u>

(1) <u>Clearance.</u>

<u>Supply service drops and sets of overhead service conductors of 0 to 750 volts running above and</u> parallel to optical fiber cable service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of 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.

(1) <u>Above Roofs.</u>

<u>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.</u>

Exception No. 1: The requirement of 3XX.44(B) 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 optical fiber cable service drop cable passes above the roof overhang, and (2) 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: See ANSI/IEEE C2-2017, National Electric Safety Code, Part 2, Safety Rules for Overhead Lines, for additional information regarding overhead wires and cables.

3XX.47 Underground Optical Fiber Cables Entering Buildings.

<u>Underground optical fiber cables entering buildings shall comply with 3XX.47(A) and (B).</u>

(1) <u>Underground Systems with Electric Light, Power, Class 1, or Non–Power-Limited Fire Alarm</u> <u>Circuit Conductors.</u>

<u>Underground conductive optical fiber cables entering buildings with electric light, power, Class 1, or non-power-limited fire alarm circuit conductors in a raceway, handhole enclosure, or manhole shall be located in a section separated from such conductors by means of brick, concrete, or tile partitions or by means of a suitable barrier.</u>

(1) <u>Direct-Buried Cables and Raceways.</u>

<u>Direct-buried conductive optical fiber cables shall be separated by at least 300 mm (12 in.) from</u> <u>conductors of any electric light, power, non - power-limited fire alarm circuit conductors, or Class 1</u> <u>circuit.</u>

Exception No. 1: Separation shall not be required where the electric service conductors are installed in raceways or have metal cable armor.

Exception No. 2: Separation shall not be required where electric light or power branch-circuit or feeder conductors, non-power-limited fire alarm circuit conductors, or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF or Type USE cables.

3XX.48 Unlisted Cables Entering Buildings.

(1) <u>Conductive and Nonconductive Cables.</u>

Unlisted conductive and nonconductive outside plant optical fiber 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.

<u>The point of entrance shall be permitted to be extended from the penetration of the external wall,</u> roof, or floor slab by continuously enclosing the entrance optical fiber cables in rigid metal conduit (<u>RMC</u>) or intermediate metal conduit (<u>IMC</u>) to the point of emergence.

<u>Informational Note: Splice cases or terminal boxes, both metallic and plastic types, typically are</u> <u>used as enclosures for splicing or terminating optical fiber cables.</u>

(1) Nonconductive Cables in Raceway.

<u>Unlisted nonconductive outside plant optical fiber cables shall be permitted to enter the building</u> from the outside and shall be permitted to be installed in any of the following raceways:

- (1) Intermediate metal conduit (IMC)
- (1) <u>Rigid metal conduit (RMC)</u>
- (1) <u>Rigid polyvinyl chloride conduit (PVC)</u>
- (1) <u>Electrical metallic tubing (EMT)</u>

<u>Unlisted nonconductive outside plant cables installed in rigid polyvinyl chloride conduit (PVC) or</u> <u>electrical metallic tubing (EMT) shall not be installed in risers, ducts used for environmental air,</u> <u>plenums used for environmental air, and other spaces used for environmental air.</u>

3XX.49 Metal Entrance Conduit Grounding.

<u>Metal conduit containing optical fiber entrance cable shall be connected by a bonding conductor or</u> <u>grounding electrode conductor to a grounding electrode or, where present, the building grounding</u> <u>electrode system in accordance with 3XX.100(B).</u>

Part III. Protection

<u>3XX.93 Grounding, Bonding, or Interruption of Non–Current-Carrying Metallic Members of</u> <u>Optical Fiber Cables.</u>

<u>Optical fiber cables entering the building or terminating on the outside of the building shall comply</u> with 3XX.93(A) or (B).

(1) Entering Buildings.

<u>In installations where an optical fiber cable is exposed to contact with electric light or power</u> <u>conductors and the cable enters the building, the non-current-carrying metallic members shall be</u> <u>either grounded or bonded as specified in 3XX.100 or interrupted by an insulating joint or</u> <u>equivalent device. The grounding or interruption shall be as close as practicable to the point of</u> <u>entrance.</u>

(1) <u>Terminating on the Outside of Buildings.</u>

<u>In installations where an optical fiber cable is exposed to contact with electric light or power</u> 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 in3XX.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.

Part IV. Grounding Methods

3XX.100 Entrance Cable Bonding and Grounding.

<u>If required, the non-current-carrying metallic members of optical fiber cables entering buildings</u> <u>shall be bonded or grounded as specified in 3XX.100(A) through (D).</u>

- (1) <u>Bonding Conductor or Grounding Electrode Conductor.</u>
- (1) Insulation.

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

(1) Material.

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

(1) <u>Size.</u>

<u>The bonding conductor or grounding electrode conductor shall not be smaller than 14 AWG. It</u> <u>shall have a current-carrying capacity not less than that of the grounded metallic member(s). The</u> <u>bonding conductor or grounding electrode conductor shall not be required to exceed 6 AWG.</u>

(1) Length.

<u>The bonding conductor or grounding electrode conductor shall be as short as practicable. In one-</u> 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 develop between the building's power and communications systems during lightning events.

Exception: In one- and two-family dwellings if 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 3XX.100(B)(3)(2) shall be driven, the grounding electrode conductor shall be connected to the separate ground rod in accordance with 3XX.100(C), and the separate ground rod shall be bonded to the power grounding electrode system in accordance with 3XX.100(D).

(1) <u>Run in Straight Line.</u>

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

(1) <u>Physical Protection.</u>

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.

(1) <u>Electrode.</u>

<u>The bonding conductor and grounding electrode conductor shall be connected in accordance with 3XX.100(B)(1), (B)(2), or (B)(3).</u>

(1) <u>In Buildings or Structures with an Intersystem Bonding Termination.</u>

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.

<u>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.</u>

(1) In Buildings or Structures with Grounding Means.

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

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

- (1) <u>The building or structure grounding electrode system as covered in 250.50.</u>
- (2) <u>The power service accessible means external to enclosures using the options identified in 250.94(A), Exception</u>
- (3) <u>The nonflexible metal power service raceway</u>
- (4) <u>The service equipment enclosure</u>
- (5) <u>The grounding electrode conductor or the grounding electrode conductor metal enclosure of</u> <u>the power service</u>
- (6) <u>The grounding electrode conductor or the grounding electrode of a building or structure</u> <u>disconnecting means that is connected to a grounding electrode as covered in 250.32.</u>
- (7) <u>The grounded interior metal water piping system, within 1.5m (5 ft) from its point of entrance</u> to the building, as covered in 250.52.

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.

(1) <u>In Buildings or Structures Without Intersystem Bonding Termination or Grounding Means.</u>

If the building or structure served has no intersystem bonding termination or grounding means, as described in3XX.100(B)(2), the grounding electrode conductor shall be connected to either of the following:

- <u>To any one of the individual grounding electrodes described in 250.52(A)(1), (A)(2), (A)(3), or</u> (<u>A)(4).</u>
- 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.
- (1) <u>Electrode Connection.</u>

Connections to grounding electrodes shall comply with 250.70.

(1) Bonding of Electrodes.

<u>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.</u>

Exception: At mobile homes as covered in 770.106.

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.

3XX.106 Grounding and Bonding of Entrance Cables at Mobile Homes.

(1)

(a) Grounding.

Grounding shall comply with 3XX.106(A)(1) and (A)(2).

(1) Installations Without Mobile Home Service Equipment.

If there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the non-current-carrying metallic members of optical fiber cables entering the mobile home shall be grounded in accordance with 3XX.100(B)(3).

(1) Installations Without Mobile Home Disconnecting Means.

If there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the non-current-carrying metallic members of optical fiber cables entering the mobile home shall be grounded in accordance with 3XX.100(B)(3).

(1)

(a) <u>Bonding.</u>

<u>The grounding electrode shall be bonded to the metal frame or available grounding terminal of the</u> <u>mobile home with a copper conductor or other equivalent corrosion-resistant material not smaller</u> <u>than 12 AWG under either of the following conditions:</u>

- (1) If there is no mobile home service equipment or disconnecting means as in 3XX.106(A).
- (2) If the mobile home is supplied by cord and plug

Part V. Installation Methods Within Buildings

3XX.110 Raceways, Cable Routing Assemblies, and Cable Trays for Optical Fiber Cables.

(1) <u>Types of Raceways.</u>

<u>Optical fiber cables shall be permitted to be installed in any raceway that complies with either 3XX.110(A)(1) or (A)(2).</u>

(1) <u>Raceways Recognized in Chapter 3.</u>

<u>Optical fiber cables shall be permitted to be installed in any raceway included in Chapter 3. The</u> raceways shall be installed in accordance with Chapter 3.

(1) <u>Communications Raceways.</u>

<u>Optical fiber cables shall be permitted to be installed in listed communications raceways</u> selected in accordance with Table 800.154(b).

(1) <u>Raceway Fill for Optical Fiber Cables.</u>

Raceway fill for optical fiber cables shall comply with either 3XX.110(B)(1) or (B)(2).

(1)

(a) <u>Without Electric Light or Power Conductors.</u>

<u>Where optical fiber cables are installed in raceway without electric light or power conductors,</u> <u>the raceway fill requirements of Chapters 3 and 9 shall not apply.</u>

(1)

(a) Nonconductive Optical Fiber Cables with Electric Light or Power Conductors.

<u>Where nonconductive optical fiber cables are installed with electric light or power conductors in a raceway, the raceway fill requirements of Chapters 3 and 9 shall apply.</u>

(1) <u>Cable Routing Assemblies.</u>

<u>Optical fiber cables shall be permitted to be installed in listed cable routing assemblies selected in accordance with Table 800.154(c).</u>

(1) <u>Cable Trays.</u>

<u>Optical fiber cables shall be permitted to be installed in metal or listed nonmetallic cable tray</u> <u>systems.</u>

**<u>3XX.111 Innerduct for Optical Fiber Cables.</u>** 

<u>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.</u>

3XX.113 Installation of Optical Fiber Cables.

<u>Installation of optical fiber cables shall comply with 3XX.113(A) through (J). Installation of</u> raceways and cable routing assemblies shall comply with 3XX.110.

(1) <u>Listing.</u>

<u>Optical fiber cables installed in buildings shall be listed in accordance with 3XX.179 and installed</u> in accordance with the limitations of the listing.

Exception: Optical fiber cables that are installed in compliance with 3XX.48 shall not be required to be listed.

(1) <u>Ducts Specifically Fabricated for Environmental Air.</u>

Installations of optical fiber cables in ducts specifically fabricated for environmental air shall be in accordance with 3XX.113(B)(1) and (B)(2).

(1) Uses Permitted.

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

- (1) <u>Up to 1.22 m (4 ft) of Types OFNP and OFCP</u>
- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that</u> <u>are installed in compliance with 300.22(B).</u>

<u>Informational Note: For information on fire protection of wiring installed in fabricated ducts,</u> see NFPA 90A-2018, <u>Standard for the Installation of Air-Conditioning and Ventilating Systems</u>.

(1) <u>Uses Not Permitted.</u>

<u>Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in</u> <u>ducts specifically fabricated for environmental air as described in 300.22(B).</u>

<u>Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and</u> <u>Ventilating Systems, for information on fire protection of wiring installed in fabricated ducts.</u>

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

<u>Installations of optical fiber cables in other spaces used for environmental air shall be in</u> accordance with 3XX.113(C)(1) and (C)(2).

(1) Uses Permitted.

<u>The following cables shall be permitted in other spaces used for environmental air as described</u> in 300.22(C).

- (1) <u>Types OFNP and OFCP.</u>
- (1) <u>Types OFNP and OFCP installed in plenum communications raceways.</u>
- (1) <u>Types OFNP and OFCP installed in plenum cable routing assemblies.</u>
- (1) <u>Types OFNP and OFCP supported by open metal cable tray systems.</u>
- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that</u> <u>are installed in compliance with.</u>
- <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC supported by solid</u> bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 300.22(C).
- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in plenum riser</u> 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 <u>300.22(C)</u>.
- (1) <u>Uses Not Permitted.</u>

<u>Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in</u> <u>other spaces used for environmental air (plenums).</u>

Informational Note: See NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and* <u>Ventilating Systems</u>, for information on fire protection of wiring \_ installed in other spaces used for environmental air.

(1) <u>Risers — Cables in Vertical Runs.</u>

<u>Installations of optical fiber cables in vertical runs shall be in accordance with 3XX.113(D)(1) and (D)(2).</u>

(1) <u>Uses Permitted.</u>

<u>The following cables shall be permitted in vertical runs penetrating one or more floors and in</u> <u>vertical runs in a shaft:</u>

(1)

- (a) <u>Types OFNP, OFCP, OFNR, and OFCR.</u>
- (b) <u>Types OFNP, OFCP, OFNR, and OFCR installed in the following:</u>

(1)

- (a) <u>Plenum communications raceways</u>
- (b) <u>Plenum cable routing assemblies</u>
- (C) <u>Riser communications raceways</u>
- (d) <u>Riser cable routing assemblies</u>
- (1) <u>Uses Not Permitted.</u>

<u>Types OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in vertical runs.</u> <u>Informational Note: See 3XX.26 for firestop requirements for floor penetrations.</u>

(1) <u>Risers — Cables Permitted in Metal Raceways.</u>

<u>The following cables and innerducts shall be permitted in metal raceways in a riser having firestops</u> <u>at each floor:</u>

- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC</u>
- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:</u>

(1)

- (a) <u>Plenum communications raceways (innerduct)</u>
- (b) <u>Riser communications raceways (innerduct)</u>
- (C) General-purpose communications raceways (innerduct)

Informational Note: See 3XX.26 for firestop requirements for floor penetrations.

(1) <u>Risers — Cables Permitted in Fireproof Shafts.</u>

<u>The following cables shall be permitted to be installed in fireproof riser shafts having firestops at each floor:</u>

- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC</u>
- (2) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:</u>

(3)

- i. <u>Plenum communications raceways</u>
- ii. <u>Plenum cable routing assemblies</u>
- iii. <u>Riser communications raceways</u>
- iv. <u>Riser cable routing assemblies</u>
- V. <u>General-purpose communications raceways</u>
- vi. General-purpose cable routing assemblies

Informational Note: See 3XX.26 for firestop requirements for floor penetrations.

(1) <u>Risers – Cables Permitted in One- and Two-Family Dwellings.</u>

The following cables shall be permitted in one- and two-family dwellings:

- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC</u>
- (2) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in in the</u> <u>following:</u>
  - (3)
- i. <u>Plenum communications raceways</u>
- ii. <u>Plenum cable routing assemblies</u>
- iii. Riser communications raceways
- iv. Riser cable routing assemblies
- V. General-purpose communications raceways
- vi. General-purpose cable routing assemblies
- (1) <u>Cable Trays-Cables Permitted.</u>

The following cables shall be permitted to be supported by cable trays:

- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC</u>
- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:</u>
  - (2) <u>Plenum communications raceways</u>
  - (3) <u>Riser communications raceways</u>
  - (4) <u>General-purpose communications raceways</u>
- (1) <u>Distributing Frames and Cross-Connect Arrays-Cables Permitted.</u>

<u>The following cables shall be permitted to be installed in distributing frames and cross-connect</u> <u>arrays:</u>

(1)

- (a)
  - i.
- i. Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- ii. <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in</u> <u>the following:</u>

```
(1)
(a)
```

i. <u>Plenum communications raceways</u>

i.

- ii. Plenum cable routing assemblies
- iii. Riser communications raceways
- iv. <u>Riser cable routing assemblies</u>
- V. <u>General-purpose communications raceways</u>
- vi. <u>General-purpose cable routing assemblies</u>
- (2) Other Building Locations-Cables Permitted.

<u>The following cables shall be permitted to be installed in building locations other than the locations</u> <u>covered in 3XX.113(B) through (I):</u>

- (1) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC</u>
- (2) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in:</u>
  - (3) <u>Plenum communications raceways</u>
  - (4) <u>Plenum cable routing assemblies</u>
  - (5) <u>Riser communications raceways</u>
  - (6) <u>Riser cable routing assemblies</u>
  - (7) <u>General-purpose communications raceways</u>
  - (8) <u>General-purpose cable routing assemblies</u>

## (9) <u>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in a raceway of a</u> <u>type recognized in Chapter 3.</u>

#### 3XX.114 Grounding.

<u>Non-current-carrying conductive members of optical fiber cables shall be bonded to a grounded</u> <u>equipment rack or enclosure or grounded in accordance with the grounding methods specified by</u> <u>3XX.100(B) using a conductor specified in 3XX.100(A).</u>

3XX.133 Installation of Optical Fibers and Electrical Conductors.

(1) In Cable Trays and Raceways.

<u>Conductive optical fiber cables contained in an armored or metal-clad-type sheath and</u> <u>nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with</u> <u>conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-</u> <u>power network-powered broadband communications circuits operating at 1000 volts or less.</u> <u>Conductive optical fiber cables without an armored or metal-clad-type sheath shall not be</u> <u>permitted to occupy the same cable tray or raceway with conductors for electric light, power,</u> <u>Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband</u> <u>communications circuits, unless all of the conductors of electric light, power, Class 1, non-powerlimited fire alarm, and medium-power network-powered broadband communications circuits are <u>separated from all of the optical fiber cables by a permanent barrier or listed divider.</u></u>

(1) In Cabinets, Outlet Boxes, and Similar Enclosures.

<u>Nonconductive optical fiber cables shall not be permitted to occupy the same cabinet, outlet box,</u> <u>panel, or similar enclosure housing the electrical terminations of an electric light, power, Class 1,</u> <u>non-power-limited fire alarm, or medium-power network-powered broadband communications</u> <u>circuit unless one or more of the following conditions exist:</u>

- <u>The nonconductive optical fiber cables are functionally associated with the electric light,</u> power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit.
- <u>The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or</u> <u>medium-power network-powered broadband communications circuits operate at 1000 volts or</u> <u>less.</u>
- (1) <u>The nonconductive optical fiber cables and the electrical terminations of electric light, power,</u> <u>Class 1, non-power-limited fire alarm, or medium-power network-powered broadband</u> <u>communications circuit are installed in factory- or field-assembled control centers.</u>
- (1) <u>The nonconductive optical fiber cables are installed in an industrial establishment where</u> <u>conditions of maintenance and supervision ensure that only qualified persons service the</u> <u>installation.</u>

When optical fibers are within the same hybrid cable for electric light, power, Class 1, non-powerlimited 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.

<u>Optical fibers in hybrid optical fiber cables containing only current-carrying conductors for</u> <u>electric light, power, or Class 1 circuits rated 1000 volts or less shall be permitted to occupy the</u> <u>same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with conductors</u> <u>for electric light, power, or Class 1 circuits operating at 1000 volts or less.</u>

<u>Optical fibers in hybrid optical fiber cables containing current-carrying conductors for electric</u> <u>light, power, or Class 1 circuits rated over 1000 volts shall be permitted to occupy the same cabinet,</u> <u>cable tray, outlet box, panel, raceway, or other termination enclosure with conductors for electric</u> <u>light, power, or Class 1 circuits in industrial establishments, where conditions of maintenance and</u> <u>supervision ensure that only qualified persons service the installation.</u>

(1) With Other Circuits.

<u>Conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:</u>

- (1) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725.</u>
- (2) <u>Power-limited fire alarm systems in compliance with Parts I and III of Article 760.</u>
- (3) <u>Communications circuits in compliance with Parts I and V of Article 805.</u>
- (4) <u>Community antenna television and radio distribution systems in compliance with Parts I and</u> <u>V of Article 820.</u>
- (5) <u>Low-power network-powered broadband communications circuits in compliance with Parts I</u> and V of Article 830.
- (1) <u>Support of Optical Fiber Cables.</u>

<u>Raceways shall be used for their intended purpose. Optical fiber cables shall not be strapped,</u> <u>taped, or attached by any means to the exterior of any conduit or raceway as a means of support.</u>

Exception: Overhead (aerial) spans of optical fiber cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such cables.

3XX.154 Applications of Listed Optical Fiber Cables.

<u>Permitted and nonpermitted applications of listed optical fiber cables shall be as indicated in Table</u> <u>3XX.154(a). The permitted applications shall be subject to the installation requirements of</u> <u>3XX.110 and 3XX.113. The substitutions for optical fiber cables in Table 3XX.154(b) and illustrated</u> <u>in Figure 3XX.154 shall be permitted.</u>

Table 3XX.154(a) Applications of Listed Optical Fiber Cables in Buildings				
		<u>Liste</u>	d Optical 1	Fiber
		<u>Cable Type</u>		<u>)</u>
		OFNP OFCP	OFNR OFCR	OFNG OFCG OFN
	<b>Applications</b>			<u>OFC</u>
In ducts specifically fabricated for environmental air as described in 300.22(B)	In fabricated ducts	<u>Y*</u>	N	N
	In metal raceway that complies with <u>300.22(B)</u>	<u>Y*</u>	<u>Y*</u>	<u>¥*</u>
In other spaces used for environmental air (plenums) as described in 300.22(C)	<u>In other spaces</u> <u>used for</u> <u>environmental air</u>	<u>Y*</u>	<u>N</u>	<u>N</u>
	In metal raceway that complies with 300.22(C)	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	<u>In plenum</u> <u>communications</u> <u>raceway</u>	<u>Y*</u>	<u>N</u>	<u>N</u>
	In plenum cable routing assemblies	<u>Y*</u>	<u>N</u>	<u>N</u>
	<u>Supported by open</u> metal cable trays	<u>Y*</u>	<u>N</u>	<u>N</u>
	<u>Supported by solid</u> <u>bottom metal cable</u> <u>trays with solid</u> <u>metal covers</u>	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
In risers	In vertical runs	<u>Y*</u>	<u>Y*</u>	N
	In metal raceways	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	In fireproof shafts	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	<u>In plenum</u> <u>communications</u> <u>raceway</u>	<u>Y*</u>	<u>Y*</u>	<u>N</u>
	In plenum cable routing assemblies	<u>Y*</u>	<u>Y*</u>	<u>N</u>
	<u>In riser</u> <u>communications</u>	<u>Y*</u>	<u>Y*</u>	<u>N</u>
	I	1	1	1

	<u>raceways</u>			
	In riser cable routing assemblies	<u>Y*</u>	<u>Y*</u>	<u>N</u>
	In one- and two- family dwellings	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
<u>Within buildings in</u>	<u>General</u>	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
<u>other than air-</u> <u>handling spaces and</u> risers	<u>Supported by cable</u> <u>trays</u>	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
113(13	In distributing frames and cross- connect arrays	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	<u>In any raceways</u> recognized by Chapter 3	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	<u>In plenum</u> <u>communications</u> <u>raceway</u>	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	In plenum cable routing assemblies	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	<u>In riser</u> <u>communications</u> <u>raceways</u>	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	In riser cable routing assemblies	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	In general-purpose communications raceways	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
	In general-purpose cable routing assemblies	<u>Y*</u>	<u>Y*</u>	<u>Y*</u>
Note: "N" indicates the installed in the applica permitted to be install described in 770.110 a	at the cable type shall ation. "Y*" indicates th ed in the application su nd 770.113.	not be per at the cab ibject to th	<u>mitted to b</u> le <u>type sha</u> le limitatio	<u>e</u> II be ns
Informational Note Note Note Note Note Note Note Note	<u>o. 1: Part V of Article 7</u> ngs. This table covers t	70 covers i he applica	installation tions of list	<u>ı</u> ted
<u>optical fiber cables in</u> <u>770.2.</u>	<u>buildings. The definition</u>	on of <u>Poin</u> t	<u>t of Entran</u>	<u>ce_is in</u>
Informational Note Note Note Note Note Note Note Note	o. 2: For information o fiber cables in ducts sp <u>770.113(B).</u>	n the restr ecifically fa	ictions to t abricated f	<u>he</u> Ìor
Table 3X	X.154(b) Cable Substit	<u>utions</u>		
Califa Tana	<b>D</b> '44 10 1			-

<u>Cable Type</u>	Permitted Substitutions	
<u>OFNP</u>	None	

<u>OFCP</u>	OFNP
<u>OFNR</u>	OFNP
<u>OFCR</u>	OFNP, OFCP, OFNR
<u>OFNG, OFN</u>	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OGN
	Nonconductive Conductive
Plenum	
Riser	

OFCG

OFC

OFN  $A \rightarrow B$  Cable A shall be permitted to be used in place of cable B.

OFNG

Figure 3XX.154 Cable Substitution Hierarchy

Part VI. Listing Requirements

General purpose

3XX.179 Optical Fiber Cables.

Optical fiber cables shall be listed and identified in accordance with 3XX.179(A) through (G) and shall be marked in accordance with Table 3XX.179. Optical fiber cables shall have a temperature rating of not less than 60°C (140°F). The temperature rating shall be marked on the jacket of optical fiber cables that have a temperature rating exceeding 60°C (140°F).

Informational Note: See UL 1651-2015, Standard for Optical Fiber Cable, for information on optical fiber cables.

Table 3XX.179 Cable Markings		
Cable Marking	Туре	
<u>OFNP</u>	Nonconductive optical fiber cable	
<u>OFCP</u>	Conductive optical fiber cable	
<u>OFNR</u>	Nonconductive optical fiber riser cable	
<u>OFCR</u>	Conductive optical fiber riser cable	
<u>OFNG</u>	Nonconductive optical fiber for general- purpose	
<u>OFCG</u>	<u>Conductive optical fiber general-purpose</u> <u>cable</u>	
OFN	<u>Nonconductive optical fiber general-purpose</u> <u>cable</u>	
<u>OFC</u>	<u>Conductive optical fiber general-purpose</u> <u>cable</u>	

(1)

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#### i. Types OFNP and OFCP.

<u>Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be suitable</u> for use in ducts, plenums, and other space used for environmental air and shall also have adequate fire-resistant and low-smoke-producing characteristics.

Informational Note: See NFPA 262-2019, *Standard Methods of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, for one* method of defining that a cable has adequate fire-resistant and low-smoke-producing characteristics where 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.

(1)

(a) i. i. i. <u>Types OFNR and OFCR.</u>

<u>Types of the and of end</u>

<u>Types OFNR and OFCR nonconductive and conductive optical fiber riser cables shall be suitable</u> <u>for use in a vertical run in a shaft or from floor to floor and shall also have the fire-resistant</u> <u>characteristics capable of preventing the carrying of fire from floor to floor.</u>

Informational Note: See ANSI/UL 1666-2017, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts, for one method of defining fireresistant characteristics capable of preventing the carrying of fire from floor to floor.

(1)

(a)

i.

i.

i. Types OFNG and OFCG.

<u>Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall</u> <u>be suitable for general-purpose use, with the exception of risers and plenums, and shall also be</u> <u>resistant to the spread of fire.</u>

Informational Note No. 1: See CSA Vertical Flame Test – Cables in Cable Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), *Test Methods for Electrical Wires and Cables*, for one method of defining *resistant to the spread of fire* for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the test.

Informational Note No. 2: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray-Fire-Prorogation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for another method of defining resistant to the spread of fire where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

(1)

- (a)
- i.

i.,

#### i. Types OFN and OFC.

<u>Types OFN and OFC nonconductive and conductive optical fiber cables shall be suitable for</u> <u>general-purpose use, with the exception of risers, plenums, and other spaces used for environmental</u> <u>air, and shall also be resistant to the spread of fire.</u>

<u>Informational Note No. 1: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray-Fire-</u> <u>Prorogation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for another method of defining resistant to the spread of fire where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.</u>

<u>Informational Note No. 1: See CSA Vertical Flame Test – Cables in Cable Trays, as described in</u> <u>CSA C22.2 No. 0.3-2009 (R2019), *Test Methods for Electrical Wires and Cables,* for one method of <u>defining *resistant to the spread of fire*</u> for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the test.</u>

Informational Note No. 3: Cable types are listed in descending order of fire resistance rating. Within each fire resistance rating, nonconductive cable is listed first because it is often substituted for conductive cable.

(1)

## (a)

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i. <u>Circuit Integrity (CI), Fire-Resistive Cable System, or Electrical Circuit</u> <u>Protective System.</u>

<u>Cables that are used for survivability of critical circuits under fire conditions shall meet either</u> <u>3XX.179(E)(1), (E)(2), or (E)(3).</u>

(1) <u>Circuit Integrity (CI) Cables.</u>

<u>Cables specified in 3XX.179(A) through (D), and used for survivability of critical circuits, shall</u> be marked with the additional classification using the suffix "CI." In order to maintain its listed fire rating, CI cable shall only be installed in free air in accordance with 3XX.24. CI cables shall only be permitted to be installed in a raceways where specifically listed and marked as part of a fire-resistant cable system as covered in 3XX.179(E)(2).

Informational Note: See UL 2196, Standard for Fire Test for Circuit Integrity of Fire-Resistive Power Instrumentation, Control and Data Cables, for one method of defining CI cable for establishing a minimum 2-hour fire resistance rating for the cable as specified in UL 1651, Optical Fiber Cable. UL Guide Information for Optical Cable Fiber (QAYK) contains information to maintain the fireresistive rating.

(1) <u>Fire-Resistive Cables.</u>

<u>Cables specified in 3XX.179(A) through (D) and 3XX.179(E)(1) that are part of an electrical</u> <u>circuit protective system shall be fire-resistive cable and identified with the protective system</u> <u>number on the product or on the smallest unit container in which the product is packaged and</u> <u>installed in accordance with the listing of the protective system.</u>

Informational Note: See UL, Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables, for one method of defining an electrical circuit protective system for establishing a rating for the system. UL Guide Information for Electrical

<u>Circuit Integrity Systems (FHIT) contains information to identify the system and its installation</u> limitations to maintain a minimum fire-resistive rating.
(1)
(a)
i.
i.
i. <u>Field-Assembled Optical Fiber Cables.</u>
Field-assembled optical fiber cable shall comply with the following:
(1) <u>The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the types in 3XX.179(A), (B), or (D) and shall be marked in accordance with Table 3XX.179.</u>
(1) <u>The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.</u>
(1) <u>The optical fibers shall have a permanent marking, such as a marker tape, indicating the</u> jacket with which they are identified for use.
(1) <u>The jacket without fibers shall meet the listing requirements for communications raceways in</u> <u>800.182(A), (B), or (C) in accordance with the cable marking.</u>
(1)
(a)
i.
i.
i. <u>Optional Markings.</u>
<u>Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.</u>
Informational Note: These markings can include, but are not limited to, markings for limited-
smoke natogen-tree, low-smoke natogen-tree, and sunlight resistance.
SAX.100 Grounding Devices. Where bonding or grounding is required devices used to connect a shield a sheath or non-
<u>current-carrying metallic members of a cable to a bonding conductor or grounding electrode</u> <u>conductor shall be listed or be part of listed equipment.</u>
Statement of Problem and Substantiation for Public Input
Chapter 7 is for Special Conditions, Article 770 currently pertains to Fiber Optic Cable this is a wiring method, as such a more appropriate location is somewhere in chapter 3.
Related Public Inputs for This Document
Related Input     Relationship       Public Input No. 1704-NFPA 70-2023 [Article 770]     Public Input No. 1704-NFPA 70-2023 [Article 770]
Submitter information verification
Submitter F
---------------------
Organizatio
Affiliation:
Street Addr
City:
State:
Zip:
Submittal D
Committee:
Committee Statement
Resolution

<ul> <li>Part I General</li> <li>770.1 - Scope:</li> <li>This article covers the installation of optical fiber cables. This article does not cover the construction of optical fiber cables.</li> <li>770.3 - Other Articles:</li> <li>Installations of optical fiber cables shall comply with 770.3(A) through (D). Only those section of Chapter 2 and Article 300 referenced in this article shall apply to optical fiber cables.</li> <li>(A) - Hazardous (Classified) Locations:</li> <li>Listed optical fiber cables shall be permitted to be installed in hazardous (classified) locations The cables shall be sealed in accordance with 501.15 - 502.15 - 505.16 - or 506.16 - as applicable:</li> <li>(B) - Cables in Ducts for Dust, Loose Stock, or Vapor Removal.</li> <li>The requirements of 300.22(A) for wiring systems shall apply to conductive optical fiber cables (G) - Hybrid Cables.</li> <li>Hybrid optical fiber cables shall be classified as electrical cables in accordance with the type of electrical conductors. They shall be constructed, listed, and marked in accordance with the appropriate article for each type of electrical cables.</li> <li>(D) - Vertical Support for Fire-Resistive Cables.</li> <li>Vertical installations of circuit integrity (CI) cables installed in a raceway or cables of fire-resist cable systems shall be installed in accordance with their listing:</li> <li>770.21 - Access to Electrical Equipment Behind Panels Designed to Allow Access.</li> <li>Access to electrical equipment shall not be denied by an accumulation of optical fiber cables to prevents removal of panels, including suspended ceiling panels.</li> <li>770.24 - Mechanical Execution of Work.</li> </ul>	Article 770 Optica	HFiber Cables
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770.24 Mechanical Execution of Work.	Access to electrical e prevents removal of (	equipment shall not be denied by an accumulation of optical fiber cables th panels, including suspended ceiling panels.
	770.24 Mechanical	Execution of Work.

#### (A) General.

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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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.

Informational Note No. 1: See ANSI/NECA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables, 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, for accepted industry practices.

Informational Note No. 2: See NFPA 90A-2021, 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.

(B) Circuit Integrity (CI) Cable.

Circuit integrity (CI) cable shall be supported at a distance not exceeding 610 mm (24 in.).Cable shall be secured to the noncombustible surface of the building structure. Cable supports and fasteners shall be steel.

770.25 Abandoned Cables.

The accessible portion of abandoned optical fiber 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.

770.26 - Spread of Fire or Products of Combustion.

Installations of optical fiber 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 optical fiber 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 770.26 can be found in building codes, fire resistance directories, and product listings.

770.27 Temperature Limitation of Optical Fiber Cables.

Optical fiber cable shall not be used in such a manner that its operating temperature exceeds that of its rating.

Part II. Cables Outside and Entering Buildings

770.44 Overhead (Aerial) Optical Fiber Cables.

Overhead optical fiber cables containing a non-current-carrying metallic member entering buildings shall comply with 800.44(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 770.44(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(B).

(4) Clearance.

Supply service drops and sets of overhead service conductors of 0 to 750 volts running above and parallel to optical fiber cable service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of 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.

(B) 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: The requirement of 770.44(B) 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 optical fiber cable service drop cable passes above the roof overhang, and (2) 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: See ANSI/IEEE C2-2017, National Electric Safety Code, Part 2, Safety Rules for Overhead Lines, for additional information regarding overhead wires and cables.

770.47 Underground Optical Fiber Cables Entering Buildings.

Underground optical fiber cables entering buildings shall comply with 770.47(A) and (B).

(A) Underground Systems with Electric Light, Power, Class 1, or Non–Power-Limited Fire Alarm Circuit Conductors.

Underground conductive optical fiber cables entering buildings with electric light, power, Class 1, or non-power-limited fire alarm circuit conductors in a raceway, handhole enclosure, or manhole shall be located in a section separated from such conductors by means of brick, concrete, or tile partitions or by means of a suitable barrier.

(B) Direct-Buried Cables and Raceways.

Direct-buried conductive optical fiber cables shall be separated by at least 300 mm (12 in.) from conductors of any electric light, power, non-power-limited fire alarm circuit conductors, or Class 1 circuit.

Exception No. 1: Separation shall not be required where the electric service conductors are installed in raceways or have metal cable armor.

Exception No. 2: Separation shall not be required where electric light or power branch-circuit or feeder conductors, non-power-limited fire alarm circuit conductors, or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF or Type USE cables.

770.48 Unlisted Cables Entering Buildings.

#### (A) - Conductive and Nonconductive Cables.

Unlisted conductive and nonconductive outside plant optical fiber 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.

The point of entrance shall be permitted to be extended from the penetration of the external wall, roof, or floor slab by continuously enclosing the entrance optical fiber cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.

Informational Note: Splice cases or terminal boxes, both metallic and plastic types, typically are used as enclosures for splicing or terminating optical fiber cables.

(B) Nonconductive Cables in Raceway.

Unlisted nonconductive outside plant optical fiber cables shall be permitted to enter the building from the outside and shall be permitted to be installed in any of the following raceways:

- (1) Intermediate metal conduit (IMC)
- (2) Rigid metal conduit (RMC)
- (3) Rigid polyvinyl chloride conduit (PVC)
- (4) Electrical metallic tubing (EMT)

Unlisted nonconductive outside plant cables installed in rigid polyvinyl chloride conduit (PVC) or electrical metallic tubing (EMT) shall not be installed in risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air.

770.49 Metal Entrance Conduit Grounding.

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

Part III. Protection

**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.

Part IV. Grounding Methods

770.100 Entrance Cable Bonding and Grounding.

If required, the non-current-carrying metallic members of optical fiber cables entering buildings shall be bonded or grounded as specified in 770.100(A) through (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 corrosionresistant conductive material, stranded or solid.

#### (3) 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 that of the grounded metallic member(s). 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 develop between the building's power and communications systems during lightning events.

Exception: In one- and two-family dwellings if 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 770.100(B)(3)(2) shall be driven, the grounding electrode conductor shall be connected to the separate ground rod in accordance with 770.100(C), and the separate ground rod shall be bonded to the power grounding electrode system in accordance with 770.100(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 and grounding electrode conductor shall be connected in accordance with 770.100(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.

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.

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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 power service accessible means external to enclosures using the options identified in 250.94(A) , Exception
- (3) The nonflexible metal power service raceway
- (4) The service equipment enclosure
- (5) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service
- (6) 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
- (7) 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

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 (

<sup>4</sup> /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 non-current-carrying 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 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 770.106 -

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.

770.106 Grounding and Bonding of Entrance Cables at Mobile Homes.

(A) Grounding.

Grounding shall comply with 770.106(A)(1) and (A)(2).

(1) - Installations Without Mobile Home Service Equipment.

If there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the non-current-carrying metallic members of optical fiber cables entering the mobile home shall be grounded in accordance with 770.100(B)(3).

(2) - Installations Without Mobile Home Disconnecting Means.

If there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the non-current-carrying metallic members of optical fiber cables entering the mobile home shall be grounded in accordance with 770.100(B)(3).

(B) Bonding.

The grounding electrode shall be bonded to the metal frame or available grounding terminal of the mobile home with a copper conductor or other equivalent corrosion-resistant material not smaller than 12 AWG under either of the following conditions:

(1) If there is no mobile home service equipment or disconnecting means as in 770.106(A)

(2) If the mobile home is supplied by cord and plug

Part V. Installation Methods Within Buildings

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

(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).

(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 Chapter 3.

(2) Communications Raceways.

Optical fiber cables shall be permitted to be installed in listed communications raceways selected in accordance with Table 800.154(b).

(B) - Raceway Fill for Optical Fiber Cables.

Raceway fill for optical fiber cables shall comply with either 770.110(B)(1) or (B)(2).

(1) Without Electric Light or Power Conductors.

Where optical fiber cables are installed in raceway without electric light or power conductors, the raceway fill requirements of Chapters 3 and 9 shall not apply.

(2) - Nonconductive Optical Fiber Cables with Electric Light or Power Conductors.

Where nonconductive optical fiber cables are installed with electric light or power conductors in a raceway, the raceway fill requirements of Chapters 3 and 9 shall apply.

(C) Cable Routing Assemblies.

Optical fiber cables shall be permitted to be installed in listed cable routing assemblies selected in accordance with Table 800.154(c).

(D) Cable Trays.

Optical fiber cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

770.111 Innerduct for Optical Fiber 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.

#### 770.113 Installation of Optical Fiber Cables.

Installation of optical fiber cables shall comply with 770.113(A) through (J). Installation of raceways and cable routing assemblies shall comply with 770.110.

#### (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.

(B) - Ducts Specifically Fabricated for Environmental Air.

Installations of optical fiber cables in ducts specifically fabricated for environmental air shall be in accordance with 770.113(B)(1) and (B)(2).

# (1) Uses Permitted.

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 NFPA 90A-2018, Standard for the Installation of Air-Conditioning and Ventilating Systems -

(2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in ducts specifically fabricated for environmental air as described in 300.22(B).

Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information on fire protection of wiring installed in fabricated ducts.

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

Installations of optical fiber cables in other spaces used for environmental air shall be in accordance with 770.113(C)(1) and (C)(2).

(1) Uses Permitted.

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
- (3) Types OFNP and OFCP installed in plenum cable routing assemblies
- (4) Types OFNP and OFCP supported by open metal 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 riser 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)

#### (2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A-2018, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers — Cables in Vertical Runs.

Installations of optical fiber cables in vertical runs shall be in accordance with 770.113(D)(1) and (D)(2).

(1) Uses Permitted.

The following cables shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

- (1) Types OFNP, OFCP, OFNR, and OFCR
- (2) Types OFNP, OFCP, OFNR, and OFCR installed in the following:
  - (3) Plenum communications raceways
  - (4) Plenum cable routing assemblies
  - (5) Riser communications raceways
  - (6) Riser cable routing assemblies

#### (2) Uses Not Permitted.

Types OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in vertical runs.

Informational Note: See 770.26 for firestop requirements for floor penetrations.

(E) Risers — Cables Permitted in Metal Raceways.

The following cables and innerducts shall be permitted in metal raceways in a riser having firestops at each floor:

- (1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- (2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
  - (3) Plenum communications raceways (innerduct)
  - (4) Riser communications raceways (innerduct)
  - (5) General-purpose communications raceways (innerduct)

Informational Note: See 770.26 for firestop requirements for floor penetrations.

the eac	⊭following cables shall be permitted to be installed in fireproof riser shafts having firestops <del>h floor:</del>
(1)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
(2)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
	(3) Plenum communications raceways
	(4) Plenum cable routing assemblies
	(5) Riser communications raceways
	(6) Riser cable routing assemblies
	(7) General-purpose communications raceways
	(8) General-purpose cable routing assemblies
	Informational Note: See 770.26 for firestop requirements for floor penetrations.
<del>(G)</del>	<ul> <li>Risers — Cables Permitted in One- and Two-Family Dwellings.</li> </ul>
The	following cables shall be permitted in one- and two-family dwellings:
(1)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
(2)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
	(3) Plenum communications raceways
	(4) Plenum cable routing assemblies
	(5) Riser communications raceways
	(6) Riser cable routing assemblies
	(7) General-purpose communications raceways
	(8) General-purpose cable routing assemblies
(H)	- Cable Trave Cables Permitted
יי) <del>The</del>	following cables shall be permitted to be supported by cable trave:
(1)	
(1) (2)	Types OF NR, OF CR, OF NO, OF NO, OF NO, OF N, AND OFC
(∠)	following:
	(3) Plenum communications raceways
	(4) Riser communications raceways
	(5) General-purpose communications raceways

The arra	+ following cables shall be permitted to be installed in distributing frames and cross-connect <del>iys:</del>
(1)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
(2)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
	(3) Plenum communications raceways
	(4) Plenum cable routing assemblies
	(5) Riser communications raceways
	(6) Riser cable routing assemblies
	(7) General-purpose communications raceways
	(8) General-purpose cable routing assemblies
<del>(J)</del>	- Other Building Locations — Cables Permitted.
The loca	+ following cables shall be permitted to be installed in building locations other than the ations covered in- 770.113(B)_through (I):
(1)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCC, OFN, and OFC
(2)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in:
	(3) Plenum communications raceways
	(4) Plenum cable routing assemblies
	(5) Riser communications raceways
	(6) Riser cable routing assemblies
	(7) General-purpose communications raceways
	(8) General-purpose cable routing assemblies
(9)	Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in a raceway of a type recognized in Chapter 3
<del>77(</del>	).114 Grounding.
Nor equ	n-current-carrying conductive members of optical fiber cables shall be bonded to a grounde ipment rack or enclosure, or grounded in accordance with the grounding methods specified
by-	770.100(B) using a conductor specified in 770.100(A).

#### (A) In Cable Trays and Raceways.

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, unless all of the conductors of electric light, power, Class 1, non-powerlimited 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.

(B) In Cabinets, Outlet Boxes, and Similar Enclosures.

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 unless one or more of the following conditions exist:

- The nonconductive optical fiber cables are functionally associated with the electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit.
- (2) The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operate at 1000 volts or less.
- (3) The nonconductive optical fiber cables and the electrical terminations of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit are installed in factory- or field-assembled control centers.
- (4) The nonconductive optical fiber cables are installed in an industrial establishment where conditions of maintenance and supervision ensure that only qualified persons service the installation.

When optical fibers are within the same hybrid cable for electric light, power, Class 1, nonpower-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.

Optical fibers in hybrid 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.

Optical fibers in hybrid optical fiber cables containing current-carrying conductors for electric light, power, or Class 1 circuits rated over 1000 volts 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 in industrial establishments, where conditions of maintenance and supervision ensure that only qualified persons service the installation.

## (C) With Other Circuits.

Conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:

- Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) -or Parts I and II of Article- 725
- (2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
- (3) Communications circuits in compliance with Parts I and V of Article 805
- (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

## (D) Support of Optical Fiber Cables.

Raceways shall be used for their intended purpose. Optical fiber cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or raceway as a means of support.

*Exception:* Overhead (aerial) spans of optical fiber cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such cables.

770.154 Applications of Listed Optical Fiber Cables.

Permitted and nonpermitted applications of listed optical fiber cables shall be as indicated in Table 770.154(a). The permitted applications shall be subject to the installation requirements of 770.110 - and - 770.113. The substitutions for optical fiber cables in Table 770.154(b) - and illustrated in Figure 770.154 - shall be permitted.

Table 770.154(a) Applications of Listed Optical Fiber Cables in Buildings

- Listed Optical Fiber - Cable Type Applications OFNP, OFCP OFNR, OFCR OFNG, OFCG, OFN, OFC In ducts specifically fabricated for environmental air as described in 300.22(B) In fabricated ducts Y\* N N In metal raceway that complies with 300.22(B) Y\* Y\* Y\* 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\* - In plenum communications raceways Y\* N N - In plenum cable routing assemblies Y\* N N - Supported by open metal cable travs Y\* N N - Supported by solid bottom metal cable travs with solid metal covers Y\* Y\* In risers In vertical runs Y\* Y\* N - In metal raceways Y\* Y\* Y\* - In fireproof shafts Y\* Y\* Y\* - In plenum communications raceways Y\* Y\* N - In plenum cable routing assemblies Y\* Y\* N - In riser communications raceways Y\* Y\* N - In riser cable routing assemblies Y\* Y\* N - In one- and twofamily dwellings Y\* Y\* Y\* Within buildings in other than air-handling spaces and risers General Y\* Y\* Supported by cable trays Y\* Y\* - In distributing frames and crossconnect arrays Y\* Y\* - In any raceway recognized in Chapter 3 Y\* Y\* - In plenum communications raceway Y\* Y\* Y\* - In plenum cable routing assemblies Y\* Y\* Y\* - In riser communications raceways Y\* Y\* - In riser cable routing assemblies Y\* Y\* Y\* - In generalpurpose communications raceways Y\* Y\* Y\* - In general-purpose cable routing assemblies Y\* Y\* Y\*

Note: "N" indicates that the cable type shall not be permitted to be installed in the application. "Y\*" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 770.110 and 770.113.

Informational Note No. 1: Part V of Article 770 covers installation methods within buildings. This table covers the applications of listed optical fiber cables in buildings. The definition of *Point of Entrance* is in 770.2.

Informational Note No. 2: For information on the restrictions to the installation of optical fiber cables in ducts specifically fabricated for environmental air, see 770.113(B).

Table 770.154(b) Cable Substitutions

Cable Type Permitted Substitutions OFNP None OFCP OFNP OFNR OFNP OFCR OFNP, OFCP,

# OFNR OFNG, OFN OFNP, OFNR OFCG, OFC OFNP, OFCP, OFNR, OFCR, OFNG, OFN

# Figure 770.154 Cable Substitution Hierarchy.



#### Part VI. Listing Requirements

#### 770.179 Optical Fiber Cables.

Optical fiber cables shall be listed and identified in accordance with 770.179(A) through (G) 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). The temperature rating shall be marked on the jacket of optical fiber cables that have a temperature rating exceeding 60°C (140°F).

Informational Note: See UL 1651-2015, Standard for Optical Fiber Cable, for information on optical fiber cables.

## Table 770.179 Cable Markings

# (A) Types OFNP and OFCP.

Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be suitable for use in ducts, plenums, and other space used for environmental air and shall also have adequate fire-resistant and low-smoke-producing characteristics.

Informational Note: See NFPA 262-2019, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, for one method of defining that a cable has adequate fire-resistant and low-smoke-producing characteristics where 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.

## (B) Types OFNR and OFCR.

Types OFNR and OFCR nonconductive and conductive optical fiber riser cables shall be suitable for use in a vertical run in a shaft or from floor to floor and shall also have the fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See ANSI/UL 1666-2017, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts, for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

#### (C) Types OFNG and OFCG.

Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be suitable for general-purpose use, with the exception of risers and plenums, and shall also be resistant to the spread of fire

Informational Note No. 1: See CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), Test Methods for Electrical Wires and Cables, for one method of defining resistant to the spread of fire for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the test.

Informational Note No. 2: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray *Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for another method of defining *resistant to the spread of fire* where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

(D) Types OFN and OFC.

Types OFN and OFC nonconductive and conductive optical fiber cables shall be suitable for general-purpose use, with the exception of risers, plenums, and other spaces used for environmental air, and shall also be resistant to the spread of fire.

Informational Note No. 1: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistant to the spread of fire where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

Informational Note No. 2: See CSA Vertical Flame Test — Cables in Cables Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), *Test Methods for Electrical Wires and Cables*, for another method of defining *resistant to the spread of fire* where the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

Informational Note No. 3: Cable types are listed in descending order of fire resistance rating. Within each fire resistance rating, nonconductive cable is listed first because it is often substituted for conductive cable.

(E) - Circuit Integrity (CI), Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall meet either 770.179(E)(1), (E)(2), or (E)(3).

(1) Circuit Integrity (CI) Cables.

Cables specified in 770.179(A) through (D), and used for survivability of critical circuits, shall be marked with the additional classification using the suffix "CI." In order to maintain its listed fire rating, CI cable shall only be installed in free air in accordance with 770.24. CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 770.179(E)(2).

Informational Note: See UL 2196, Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables, for one method of defining CI cable for establishing a minimum 2-hour fire resistance rating for the cable as specified in UL 1651, Optical Fiber Cable. UL: Guide Information for Optical Cable Fiber (QAYK) contains information to identify the cable and its installation limitations to maintain the fireresistive rating.

(2) Fire-Resistive Cables. Cables specified in 770.179(A) through (D) and 770.179(E)(1) that are part of an electrical circuit protective system shall be fire-resistive cable and identified with the protective system number on the product or on the smallest unit container in which the product is packaged and installed in accordance with the listing of the protective system.
Informational Note: See UL 2196, Standard for Fire Test for Circuit Integrity of Fire- Resistive Power, Instrumentation, Control and Data Cables, for one method of defining an electrical circuit protective system for establishing a rating for the system. UL Guide Information for Electrical Circuit Integrity Systems (FHIT) contains information to identify the system and its installation limitations to maintain a minimum fire-resistive rating.
(F) Field-Assembled Optical Fiber Cables.
Field-assembled optical fiber cable shall comply with the following:
(1) The specific combination of jacket and optical fibers intended to be installed as a field- assembled optical fiber cable shall be one of the types in 770.179(A), (B), or (D) and shall be marked in accordance with Table 770.179.
(2) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.
(3) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.
(4) The jacket without fibers shall meet the listing requirements for communications raceways in 800.182(A), (B), or (C) in accordance with the cable marking.
<del>(G)</del> - <del>Optional Markings.</del>
Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.
Informational Note: These markings can include, but are not limited to, markings for limited-smoke halogen-free, low-smoke halogen-free, and sunlight resistance.
770.180 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.
Statement of Problem and Substantiation for Public Input
Article 770 is for Fiber Optic Cables which is a wiring method, as such it would be more appropriately located in Chapter 3. Chapter 7 is designated per 90.3 as special conditions.
Related Public Inputs for This Document
Related Input         Relationship           Public Input No. 4499-NFPA 70-2023 [New Section after 398.104]         Relationship
Submitter Information Verification
Organization:
Affiliation: NECA
Street Address
City
State:

Zip:Submittal Date:Fri Jul 28 20:27:36 EDT 2023Committee:NEC-P16

# **Committee Statement**

**Resolution:** The installation of optical fiber cables belongs in Article 770. Chapter 3 deals with electrical wiring methods. Also see section 300.2 Limitations.

Article	770 Optical Fiber Cables
Part I. G	General
770.1 So	cope.
This artic construct	e covers the installation of optical fiber cables. This article does not cover the ion of optical fiber cables.
770.3 Of	ther Articles.
Installation of Chapter	ons of optical fiber cables shall comply with 770.3(A) through (D). Only those section or 2 and Article 300 referenced in this article shall apply to optical fiber cables.
<del>(<b>A)</b> Haz</del>	ardous (Classified) Locations.
Listed op The cable applicable	tical fiber cables shall be permitted to be installed in hazardous (classified) locations <del>xs shall be sealed in accordance with 501.15 , 502.15 , 505.16 , or 506.16 , as</del> <del>s.</del>
<b>(B)</b> - <del>Cab</del>	les in Ducts for Dust, Loose Stock, or Vapor Removal.
<del>The requi</del> <del>cables.</del>	rements of 300.22(A) for wiring systems shall apply to conductive optical fiber
<del>(С)</del> – Нуь	<del>rid Cables.</del>
Hybrid op electrical appropria	tical fiber cables shall be classified as electrical cables in accordance with the type conductors. They shall be constructed, listed, and marked in accordance with the te article for each type of electrical cable.
(D) - Vert	ical Support for Fire-Resistive Cables.
<del>Vertical ir</del> <del>resistive (</del>	istallations of circuit integrity (CI) cables installed in a raceway or cables of fire- cable systems shall be installed in accordance with their listing.
<del>770.21</del>	Access to Electrical Equipment Behind Panels Designed to Allow Access.
Access to that preve	electrical equipment shall not be denied by an accumulation of optical fiber cables ents removal of panels, including suspended ceiling panels.
<del>770.24</del>	Mechanical Execution of Work.

#### (A) General.

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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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.

Informational Note No. 1: See ANSI/NECA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables, 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, for accepted industry practices.

Informational Note No. 2: See NFPA 90A-2021, 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.

#### (B) Circuit Integrity (CI) Cable.

Circuit integrity (CI) cable shall be supported at a distance not exceeding 610 mm (24 in.).Cable shall be secured to the noncombustible surface of the building structure. Cable supports and fasteners shall be steel.

#### 770.25 Abandoned Cables.

The accessible portion of abandoned optical fiber 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.

#### 770.26 - Spread of Fire or Products of Combustion.

Installations of optical fiber 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 optical fiber 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 770.26 can be found in building codes, fire resistance directories, and product listings.

770.27 Temperature Limitation of Optical Fiber Cables.

Optical fiber cable shall not be used in such a manner that its operating temperature exceeds that of its rating.

Part II. Cables Outside and Entering Buildings

770.44 Overhead (Aerial) Optical Fiber Cables.

<u>Overhead optical fiber cables containing a non–current-carrying metallic member entering buildings shall comply with 800.44(A) and (B).</u>

(A) On Poles and In-Span.

<u>Where outside plant optical fiber cables and electric light or power conductors are supported</u> by the same pole or are run parallel to each other in-span, the conditions described in 770.44(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.

<u>Attachment of outside plant optical fiber cables to a cross-arm that carries electric light or power conductors shall not be permitted.</u>

(3) Climbing Space.

The climbing space through outside plant optical fiber cables shall comply with the requirements of 225.14(B).

(4) Clearance.

<u>Supply service drops and sets of overhead service conductors of 0 to 750 volts running above and parallel to optical fiber cable service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of their attachment to the building.</u> Clearance of not less than 1.0 m (40 in.) shall be maintained between the two services at the pole.

(B) 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: The requirement of 770.44(B) 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 optical fiber cable service drop cable passes above the roof overhang, and (2) 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: See ANSI/IEEE C2-2017, National Electric Safety Code, Part 2, Safety Rules for Overhead Lines, for additional information regarding overhead wires and cables.

770.47 Underground Optical Fiber Cables Entering Buildings.

Underground optical fiber cables entering buildings shall comply with 770.47(A) and (B).

(A) Underground Systems with Electric Light, Power, Class 1, or Non–Power-Limited Fire Alarm Circuit Conductors.

<u>Underground conductive optical fiber cables entering buildings with electric light, power,</u> <u>Class 1, or non–power-limited fire alarm circuit conductors in a raceway, handhole enclosure,</u> <u>or manhole shall be located in a section separated from such conductors by means of brick,</u> <u>concrete, or tile partitions or by means of a suitable barrier.</u>

# (B) Direct-Buried Cables and Raceways.

<u>Direct-buried conductive optical fiber cables shall be separated by at least 300 mm (12 in.)</u> from conductors of any electric light, power, non-power-limited fire alarm circuit conductors, or <u>Class 1 circuit.</u>

<u>Exception No. 1:</u> <u>Separation shall not be required where the electric service conductors are</u> installed in raceways or have metal cable armor.

Exception No. 2: Separation shall not be required where electric light or power branch-circuit or feeder conductors, non-power-limited fire alarm circuit conductors, or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF or Type USE cables.

770.48 Unlisted Cables Entering Buildings.

(A) Conductive and Nonconductive Cables.

Unlisted conductive and nonconductive outside plant optical fiber 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.

<u>The point of entrance shall be permitted to be extended from the penetration of the external</u> wall, roof, or floor slab by continuously enclosing the entrance optical fiber cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.

Informational Note: <u>Splice cases or terminal boxes, both metallic and plastic types,</u> typically are used as enclosures for splicing or terminating optical fiber cables.

(B) Nonconductive Cables in Raceway.

Unlisted nonconductive outside plant optical fiber cables shall be permitted to enter the building from the outside and shall be permitted to be installed in any of the following raceways:

- (1) Intermediate metal conduit (IMC)
- (2) Rigid metal conduit (RMC)
- (3) Rigid polyvinyl chloride conduit (PVC)
- (4) Electrical metallic tubing (EMT)

<u>Unlisted nonconductive outside plant cables installed in rigid polyvinyl chloride conduit (PVC)</u> or electrical metallic tubing (EMT) shall not be installed in risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air.

770.49 Metal Entrance Conduit Grounding.

<u>Metal conduit containing optical fiber entrance cable shall be connected by a bonding</u> <u>conductor or grounding electrode conductor to a grounding electrode or, where present, the</u> <u>building grounding electrode system in accordance with 770.100(B)</u>.

Part III. Protection

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.

Part IV. Grounding Methods

770.100 Entrance Cable Bonding and Grounding.

If required, the non-current-carrying metallic members of optical fiber cables entering buildings shall be bonded or grounded as specified in 770.100(A) through (D).

(A) Bonding Conductor or Grounding Electrode Conductor.

(1) Insulation.

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

(2) Material.

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

(<u>3)</u> 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 that of the grounded metallic member(s). 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 develop between the building's power and communications systems during lightning events.

<u>Exception:</u> In one- and two-family dwellings if 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 770.100(B)(3)(2) shall be driven, the grounding electrode conductor shall be connected to the separate ground rod in accordance with 770.100(C), and the separate ground rod shall be bonded to the power grounding electrode system in accordance with 770.100(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 conductor is connected.

(B) Electrode.

<u>The bonding conductor and grounding electrode conductor shall be connected in accordance</u> with 770.100(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.

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) <u>The power service accessible means external to enclosures using the options identified in</u> <u>250.94(A)</u>, <u>Exception</u>
- (3) The nonflexible metal power service raceway
- (4) The service equipment enclosure
- (5) <u>The grounding electrode conductor or the grounding electrode conductor metal enclosure</u> of the power service
- (6) <u>The grounding electrode conductor or the grounding electrode of a building or structure</u> <u>disconnecting means that is connected to a grounding electrode as covered in</u> <u>250.32</u>
- (7) <u>The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of</u> <u>entrance to the building, as covered in 250.52</u>

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 <u>770.100(B)</u> (2) or (B)(3)(1), to any one of the individual grounding electrodes described in <u>250.52(A)</u> (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 non-current-carrying metallic members.

(C) Electrode Connection.

Connections to grounding electrodes shall comply with 250.70.

(D) Bonding of Electrodes.

<u>A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between</u> the 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 770.106.

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.

770.106 Grounding and Bonding of Entrance Cables at Mobile Homes.

(A) Grounding.

Grounding shall comply with 770.106(A)(1) and (A)(2).

(1) Installations Without Mobile Home Service Equipment.

If there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the non-current-carrying metallic members of optical fiber cables entering the mobile home shall be grounded in accordance with 770.100(B)(3).

(2) Installations Without Mobile Home Disconnecting Means.

If there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the non-current-carrying metallic members of optical fiber cables entering the mobile home shall be grounded in accordance with 770.100(B)(3).

(B) Bonding.

The grounding electrode shall be bonded to the metal frame or available grounding terminal of the mobile home with a copper conductor or other equivalent corrosion-resistant material not smaller than 12 AWG under either of the following conditions:

(1) If there is no mobile home service equipment or disconnecting means as in 770.106(A)

(2) If the mobile home is supplied by cord and plug

Part V. Installation Methods Within Buildings

# <u>770.</u>

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

(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).

(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 Chapter 3.

(2) Communications Raceways.

Optical fiber cables shall be permitted to be installed in listed communications raceways selected in accordance with Table 800.154(b).

(B) - Raceway Fill for Optical Fiber Cables.

Raceway fill for optical fiber cables shall comply with either 770.110(B)(1) -or (B)(2).

(1) Without Electric Light or Power Conductors.

Where optical fiber cables are installed in raceway without electric light or power conductors, the raceway fill requirements of Chapters 3 and 9 shall not apply.

(2) Nonconductive Optical Fiber Cables with Electric Light or Power Conductors.

Where nonconductive optical fiber cables are installed with electric light or power conductors in a raceway, the raceway fill requirements of Chapters 3 and 9 shall apply.

(C) Cable Routing Assemblies.

Optical fiber cables shall be permitted to be installed in listed cable routing assemblies selected in accordance with Table 800.154(c) -

(D) Cable Trays.

Optical fiber cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

770.111 Innerduct for Optical Fiber 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.

770.113 Installation of Optical Fiber Cables.

Installation of optical fiber cables shall comply with 770.113(A) through (J). Installation of raceways and cable routing assemblies shall comply with 770.110.

(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.

(B) - Ducts Specifically Fabricated for Environmental Air.

Installations of optical fiber cables in ducts specifically fabricated for environmental air shall be in accordance with 770.113(B)(1) and (B)(2).

#### (1) Uses Permitted.

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 NFPA 90A-2018, Standard for the Installation of Air-Conditioning and Ventilating Systems -

(2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in ducts specifically fabricated for environmental air as described in 300.22(B).

Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information on fire protection of wiring installed in fabricated ducts.

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

Installations of optical fiber cables in other spaces used for environmental air shall be in accordance with 770.113(C)(1) and (C)(2).

(1) Uses Permitted.

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
- (3) Types OFNP and OFCP installed in plenum cable routing assemblies
- (4) Types OFNP and OFCP supported by open metal 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 riser 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)
- (2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A-2018, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers - Cables in Vertical Runs.

Installations of optical fiber cables in vertical runs shall be in accordance with 770.113(D)(1) and (D)(2).

РΜ	National Fire Protection Association Report
(	1) Uses Permitted.
∓ ∀	The following cables shall be permitted in vertical runs penetrating one or more floors and in ertical runs in a shaft:
(*	1) Types OFNP, OFCP, OFNR, and OFCR
(2	<ol><li>Types OFNP, OFCP, OFNR, and OFCR installed in the following:</li></ol>
	(3) Plenum communications raceways
	(4) Plenum cable routing assemblies
	(5) Riser communications raceways
	(6) Riser cable routing assemblies
(	2) Uses Not Permitted.
+	ypes OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in vertical runs.
,	Informational Note: See 770.26 for firestop requirements for floor penetrations.
t T	E) - Kisers Cables Permitted in Metal Raceways.
fi	restops at each floor:
(*	1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
(2	<ol> <li>Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:</li> </ol>
	(3) Plenum communications raceways (innerduct)
	(4) Riser communications raceways (innerduct)
	(5) General-purpose communications raceways (innerduct)
	Informational Note: See 770.26 for firestop requirements for floor penetrations.

(F) Risers - Cables Permitted in Fireproof Shafts.

The following cables shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

- (1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- (2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
  - (3) Plenum communications raceways
  - (4) Plenum cable routing assemblies
  - (5) Riser communications raceways
  - (6) Riser cable routing assemblies
  - (7) General-purpose communications raceways
  - (8) General-purpose cable routing assemblies

Informational Note: See 770.26 for firestop requirements for floor penetrations.

(G) Risers - Cables Permitted in One- and Two-Family Dwellings.

The following cables shall be permitted in one- and two-family dwellings:

- (1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- (2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
  - (3) Plenum communications raceways
  - (4) Plenum cable routing assemblies
  - (5) Riser communications raceways
  - (6) Riser cable routing assemblies
  - (7) General-purpose communications raceways
  - (8) General-purpose cable routing assemblies
- (H) Cable Trays Cables Permitted.

The following cables shall be permitted to be supported by cable trays:

- (1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- (2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
  - (3) Plenum communications raceways
  - (4) Riser communications raceways
  - (5) General-purpose communications raceways

(I) - Distributing Frames and Cross-Connect Arrays — Cables Permitted.

The following cables shall be permitted to be installed in distributing frames and cross-connect arrays:

- (1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- (2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:
  - (3) Plenum communications raceways
  - (4) Plenum cable routing assemblies
  - (5) Riser communications raceways
  - (6) Riser cable routing assemblies
  - (7) General-purpose communications raceways
  - (8) General-purpose cable routing assemblies
- (J) Other Building Locations Cables Permitted.

The following cables shall be permitted to be installed in building locations other than the locations covered in 770.113(B) through (I):

- (1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
- (2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in:
  - (3) Plenum communications raceways
  - (4) Plenum cable routing assemblies
  - (5) Riser communications raceways
  - (6) Riser cable routing assemblies
  - (7) General-purpose communications raceways
  - (8) General-purpose cable routing assemblies
- (9) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in a raceway of a type recognized in Chapter 3

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# 114 Grounding.

<u>Non-current-carrying conductive members of optical fiber cables shall be bonded to a grounded equipment rack or enclosure, or grounded in accordance with the grounding methods specified by 770.100(B) using a conductor specified in 770.100(A).</u>

770.133 Installation of Optical Fibers and Electrical Conductors.

(A) In Cable Trays and Raceways.

<u>Conductive optical fiber cables contained in an armored or metal-clad-type sheath and</u> 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, unless 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.

(B) In Cabinets, Outlet Boxes, and Similar Enclosures.

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 unless one or more of the following conditions exist:

- (1) <u>The nonconductive optical fiber cables are functionally associated with the electric light,</u> <u>power, Class 1, non-power-limited fire alarm, or medium-power network-powered</u> <u>broadband communications circuit.</u>
- (2) <u>The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC,</u> or medium-power network-powered broadband communications circuits operate at <u>1000 volts or less.</u>
- (3) <u>The nonconductive optical fiber cables and the electrical terminations of electric light,</u> <u>power, Class 1, non-power-limited fire alarm, or medium-power network-powered</u> <u>broadband communications circuit are installed in factory- or field-assembled control</u> <u>centers.</u>
- (4) <u>The nonconductive optical fiber cables are installed in an industrial establishment where conditions of maintenance and supervision ensure that only qualified persons service the installation.</u>

When optical fibers are within the same hybrid cable for electric light, power, Class 1, nonpower-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.

<u>Optical fibers in hybrid optical fiber cables containing only current-carrying conductors for</u> <u>electric light, power, or Class 1 circuits rated 1000 volts or less shall be permitted to occupy</u> <u>the same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with</u> <u>conductors for electric light, power, or Class 1 circuits operating at 1000 volts or less.</u>

Optical fibers in hybrid optical fiber cables containing current-carrying conductors for electric light, power, or Class 1 circuits rated over 1000 volts 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 in industrial establishments, where conditions of maintenance and supervision ensure that only qualified persons service the installation.

# (C) With Other Circuits.

<u>Conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:</u>

- <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance</u> with <u>645.5(E)(2)</u> or Parts I and II of Article <u>725</u>
- (2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
- (3) Communications circuits in compliance with Parts I and V of Article 805
- (4) <u>Community antenna television and radio distribution systems in compliance with Parts I</u> and V of Article 820
- (5) <u>Low-power network-powered broadband communications circuits in compliance with</u> <u>Parts I and V of Article 830</u>

# (D) Support of Optical Fiber Cables.

Raceways shall be used for their intended purpose. Optical fiber cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or raceway as a means of support.

<u>Exception:</u> Overhead (aerial) spans of optical fiber cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such cables.

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154 Applications of Listed Optical Fiber Cables.

Permitted and nonpermitted applications of listed optical fiber cables shall be as indicated in Table 770.154(a). The permitted applications shall be subject to the installation requirements of 770.110 -and 770.113. The substitutions for optical fiber cables in Table 770.154(b) -and illustrated in Figure 770.154 -shall be permitted.

Table 770.154(a) Applications of Listed Optical Fiber Cables in Buildings

- Listed Optical Fiber - Cable Type Applications OFNP, OFCP OFNR, OFCR, OFCG, OFN, OFC In ducts specifically fabricated for environmental air as described in 300.22(B) In fabricated ducts Y\* N N In metal raceway that complies with 300.22(B) Y\* Y\* 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 communications raceways Y\* N N - In plenum cable routing assemblies Y\* N N - Supported by open metal cable trays Y\* N N - Supported by solid bottom metal cable trays with solid metal covers Y\* Y\* In risers In vertical runs Y\* Y\* N - In metal raceways Y\* Y\* - In fireproof shafts Y\* Y\* Y\* - In plenum communications raceways Y\* Y\* N - In plenum cable routing assemblies Y\* Y\* N - In riser communications raceways Y\* Y\* N - In riser cable routing assemblies Y\* Y\* N - In one- and two-family dwellings Y\* Y\* Y\* Within buildings in other than air-handling spaces and risers General Y\* Y\* Y\* Supported by cable travs Y\* Y\* Y\* - In distributing frames and cross-connect arrays Y\* Y\* - In any raceway recognized in Chapter 3 Y\* Y\* Y\* - In plenum communications raceway Y\* Y\* - In plenum cable routing assemblies Y\* Y\* - In riser communications raceways Y\* Y\* - In riser cable routing assemblies Y\* Y\* - In general-purpose communications raceways Y\* Y\* - In generalpurpose cable routing assemblies Y\* Y\* Y\*

Note: "N" indicates that the cable type shall not be permitted to be installed in the application. "Y\*" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 770.110 and 770.113.

Informational Note No. 1: Part V of Article 770 covers installation methods within buildings. This table covers the applications of listed optical fiber cables in buildings. The definition of *Point of Entrance* is in 770.2.

Informational Note No. 2: For information on the restrictions to the installation of optical fiber cables in ducts specifically fabricated for environmental air, see 770.113(B).

Table 770.154(b) Cable Substitutions

Cable Type Permitted Substitutions OFNP None OFCP OFNP OFNR OFNP OFCR OFNP, OFCP, OFNR OFNG, OFN OFNP, OFNR OFCG, OFC OFNP, OFCP, OFNR, OFCR, OFNG, OFN

#### Figure 770.154 Cable Substitution Hierarchy.



Part VI. Listing Requirements

770.179 Optical Fiber Cables.

Optical fiber cables shall be listed and identified in accordance with 770.179(A) through (G) 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). The temperature rating shall be marked on the jacket of optical fiber cables that have a temperature rating exceeding 60°C (140°F).

Informational Note: See UL 1651-2015, Standard for Optical Fiber Cable, for information on optical fiber cables.

#### Table 770.179 Cable Markings

Cable Marking Type OFNP Nonconductive optical fiber plenum cable OFCP Conductive optical fiber plenum cable OFNR Nonconductive optical fiber riser cable OFCR Conductive optical fiber riser cable OFNG Nonconductive optical fiber general-purpose cable OFCG Conductive optical fiber general-purpose cable OFCG Conductive optical fiber general-purpose cable OFC Conductive optical fiber general-purpose cable OFC Conductive optical fiber general-purpose cable OFCG Conductive optical fiber general-purpose cable COFCG Conductive optical fiber general-purpose cable COFCG Conductive optical fiber general-purpose cable COFCG Conductive optical fib

#### (A) Types OFNP and OFCP.

Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be suitable for use in ducts, plenums, and other space used for environmental air and shall also have adequate fire-resistant and low-smoke-producing characteristics.

Informational Note: See NFPA 262-2019, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, for one method of defining that a cable has adequate fire-resistant and low-smoke-producing characteristics where 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.

# (B) Types OFNR and OFCR.

Types OFNR and OFCR nonconductive and conductive optical fiber riser cables shall be suitable for use in a vertical run in a shaft or from floor to floor and shall also have the fireresistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See ANSI/UL 1666-2017, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts, for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

#### (C) Types OFNG and OFCG.

Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be suitable for general-purpose use, with the exception of risers and plenums, and shall also be resistant to the spread of fire

Informational Note No. 1: See CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), Test Methods for Electrical Wires and Cables, for one method of defining resistant to the spread of fire for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the test.

Informational Note No. 2: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for another method of defining- resistant to the spread of fire where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

(D) Types OFN and OFC.

Types OFN and OFC nonconductive and conductive optical fiber cables shall be suitable for general-purpose use, with the exception of risers, plenums, and other spaces used for environmental air, and shall also be resistant to the spread of fire.

Informational Note No. 1: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistant to the spread of fire where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

Informational Note No. 2: See CSA Vertical Flame Test — Cables in Cables Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), *Test Methods for Electrical Wires and Cables*, for another method of defining-*resistant to the spread of fire* where the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

Informational Note No. 3: Cable types are listed in descending order of fire resistance rating. Within each fire resistance rating, nonconductive cable is listed first because it is often substituted for conductive cable.

(E) - Circuit Integrity (CI), Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall meet either 770.179(E)(1), (E)(2), or (E)(3).

(1) Circuit Integrity (CI) Cables.

Cables specified in 770.179(A) through (D), and used for survivability of critical circuits, shall be marked with the additional classification using the suffix "CI." In order to maintain its listed fire rating, CI cable shall only be installed in free air in accordance with 770.24. CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 770.179(E)(2) -

Informational Note: See UL 2196, Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables, for one method of defining CI cable for establishing a minimum 2-hour fire resistance rating for the cable as specified in UL 1651, Optical Fiber Cable. UL Guide Information for Optical Cable Fiber (QAYK) contains information to identify the cable and its installation limitations to maintain the fire-resistive rating.

Gables specified in: 770-179(A) -through (D) and: 770-179(E)(1) that are part of an electrical circuit protective system shall be fire-resistive cable and identified with the protective system number on the product or on the marking the intervent of part of parts of pa	(2) - Fire-Resistive Cables.						
Informational Note:: Dec UL 2106; Standard for Three Tract for Circuit Integrity of Pre- Resistive Prover, Instrumentiation, Control and Data Cables; for one method of defining an electrical circuit protective system for establishing a rating for the system. UL: Guide information for Educational Circuit integrity Systems (PHT) contains information to identify the system and its installation infinitiations to maintain a minimum fire-resistive rating;         (F): Field-Assembled Optical Fiber cables shall comply with the following:         (1): The specific combination of jacket and optical fibers intended to be installed as a field- assembled optical fiber cable shall be one of the types in 776-179(A), -(B), or (D) and shall be marked in accordance with Table 770-179.         (2): The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it's identified for use:         (3): The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.         (4): The ipacket of 0.1882(A): _(B), or (C) in accordance with the cable marking;         (6): Optional Markings:         Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials:         Informational Note:: These markings can include, but are not-limited to, markings for limited-asmeke halogen-free, iow-smoke halogen-free, and sunlight resistance: 770;         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 li	Cables specified in 770.179(A) through (D) and 770.179( circuit protective system shall be fire-resistive cable and id number on the product or on the smallest unit container in installed in accordance with the listing of the protective sys	Cables specified in 770.179(A) -through (D) and 770.179(E)(1) -that are part of an electrical circuit protective system shall be fire-resistive cable and identified with the protective system number on the product or on the smallest unit container in which the product is packaged and installed in accordance with the listing of the protective system.					
<ul> <li>(F)- Field-Assembled Optical Fiber Cables:</li> <li>Field-assembled optical fiber cable shall comply with the following:         <ol> <li>The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the types in 770.179(A) - (B), or (D) and shall be marked in accordance with Table 770.179;</li> <li>The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use:             <ol></ol></li></ol></li></ul>	Informational Note: See UL 2196, Standard for Fire Resistive Power, Instrumentation, Control and Data ( an electrical circuit protective system for establishing Information for Electrical Circuit Integrity Systems (Fi identify the system and its installation limitations to m rating.	<del>Test for Circuit Integrity of Fire-</del> Cables , for one method of defining ⊢a rating for the system. UL- <i>Guide</i> HIT) -contains information to naintain a minimum fire-resistive					
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<ul> <li>(1) The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the types in 770.179 (P), or (P) and shall be marked in accordance with Table 770.179 ;</li> <li>(2) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.</li> <li>(3) The optical fibers shall most the listing requirements for communications raceways in 800.182(A) , (B), or (C) in accordance with the cable marking.</li> <li>(6) Optional Markings:</li> <li>Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials. Informational Note: These markings can include, but are not limited to, markings for limited-smoke halogen-free, low-smoke halogen-free, and sunlight resistance.</li> <li>770:</li> <li><b>180</b> Grounding Devices.</li> <li>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.</li> <li>Additional Proposed Changes</li> <li><u>File Name Description Approved</u></li> <li>Limited_Energy_TG_Substantiation.docx Substantiation</li> <li>Statement of Problem and Substantiation for Public Input</li> <li>This PI is submitted as part of the work of the 722 Limited Energy Task group. It deletes text that was relocated by the TG. See the attachment for the substantiation from the overall TG.</li> <li>Related Public Input No. 3673-NFPA.70-2023 [Article 722] same TG effort</li> <li>Public Input No. 3686-NFPA 70-2023 [Article 726] same TG effort</li> <li>Public Input No. 3686-NFPA 70-2023 [Article 726] same TG effort</li> <li>Public Input No. 3686-NFPA 70-2023 [Article 726] same TG effort</li> <li>Publi</li></ul>	Field-assembled optical fiber cable shall comply with the fo	ollowing:					
<ul> <li>(2) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.</li> <li>(3) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.</li> <li>(4) The jacket without fibers shall meet the listing requirements for communications raceways in 800-182(A) - (B), or (C) in accordance with the cable marking:</li> <li>(6) Optional Markings.</li> <li>Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.</li> <li>Informational Note: These markings can include, but are not limited to, markings for limited-smoke halogen-free, low-smoke halogen-free, and sunlight resistance.</li> <li>770:</li> <li>180_Grounding Devices.</li> <li>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.</li> <li>Additional Proposed Changes</li> <li><u>File Name</u> <u>Description Approved</u></li> <li>Limited_Energy_TG_Substantiation.docx Substantiation</li> <li>Statement of Problem and Substantiation for Public Input</li> <li>This PI is submitted as part of the work of the 722 Limited Energy Task group. It deletes text that was relocated by the TG. See the attachment for the substantiation from the overall TG.</li> <li>Related Public Inputs for This Document</li> <li><u>Related Input</u> <u>Relationship</u></li> <li><u>Public Input No. 3673-NFPA 70-2023 [Article 722]</u> same TG effort</li> <li><u>Public Input No. 3686-NFPA 70-2023 [Article 725]</u> same TG effort</li> <li><u>Public Input No. 3686-NFPA 70-2023 [Article 725]</u> same TG effort</li> <li><u>Public Input No. 3686-NFPA 70-2023 [Article 726]</u> same TG effort</li> </ul>	(1) The specific combination of jacket and optical fibers in assembled optical fiber cable shall be one of the types shall be marked in accordance with Table 770.179.	t <del>ended to be installed as a field- s in 770.179(A),(B), or (D) and</del>					
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<ul> <li>(4) The jacket without fibers shall meet the listing requirements for communications receways in 800.182(A), (B), or (C) in accordance with the cable marking.</li> <li>(G) Optional Markings:</li> <li>Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials:         <ul> <li>Informational Note: These markings can include, but are not limited to, markings for limited-smoke halogen-free, low-smoke halogen-free, and sunlight resistance:</li> <li>770:</li> <li>180 Grounding Devices.</li> <li>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.</li> </ul> </li> <li>Additional Proposed Changes         <ul> <li>Ele Name</li> <li>Description</li> <li>Approved</li> <li>Limited_Energy_TG_Substantiation.docx</li> <li>Substantiation</li> </ul> </li> <li>Statement of Problem and Substantiation for Public Input</li> <li>This PI is submitted as part of the work of the 722 Limited Energy Task group. It deletes text that was relocated by the TG. See the attachment for the substantiation from the overall TG.</li> </ul> <li>Related Public Inputs for This Document         <ul> <li>Related Input</li> <li>Relationship</li> <li>Public Input No. 3673-NFPA 70-2023 [Article 722]</li> <li>same TG effort</li> <li>Public Input No. 3684-NFPA 70-2023 [Article 724]</li> <li>same TG effort</li> <li>Public Input No. 3684-NFPA 70-2023 [Article 725]</li> <li>same TG effort</li> </ul> </li>	(3) The optical fibers shall have a permanent marking, sur- jacket with which they are identified for use.	<del>ch as a marker tape, indicating the</del>					
<ul> <li>(6) Optional Markings: Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials. Informational Note:: These markings can include, but are not limited to, markings for limited-smoke halogen-free, low-smoke halogen-free, and sunlight resistance: 770: 180. Grounding Devices. Where bonding or grounding is required, devices used to connect a shield, a sheath, or non- conductor shall be listed or be part of listed equipment.</li> <li>Additional Proposed Changes <u>Elie Name</u> <u>Description</u> <u>Approved</u> Limited_Energy_TG_Substantiation.docx Substantiation</li> <li>Statement of Problem and Substantiation for Public Input This PI is submitted as part of the work of the 722 Limited Energy Task group. It deletes text that was relocated by the TG. See the attachment for the substantiation from the overall TG.</li> <li>Related Public Inputs for This Document <u>Public Input No. 3674-NFPA 70-2023 [Article 722]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 725]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort <u>Public Input No. 3684-NFPA 70-2023 [Article 726]</u> same TG effort</li> </ul>	(4) The jacket without fibers shall meet the listing requirer raceways in 800.182(A), (B), or (C) in accordance without a state of the state of t	nents for communications ith the cable marking.					
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	Public Input No. 3686-NFPA 70-2023 [Article 726] sa	me TG effort					
Public Input No. 36 Public Input No. 36 Submitter Informat	87-NFPA 70-2023 [Article 760] 94-NFPA 70-2023 [Chapter 8] ion Verification	same TG effort					
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Submitter Full Nan	<b>1e:</b> Chad Jones						
Organization:	Cisco Systems						
Street Address:							
City:							
State:							
Zip:							
Submittal Date:	Tue Sep 05 14:06:40 EDT 2023						
Committee:	NEC-P16						
Committee Statem	ent						
<b>Resolution:</b> The m code. has no	ovement of article 770 to chapter thr It is also unclear where in Chapter 3 ot been deleted here.	ree would not aid the user or the usability of the these requirements would be moved, so 770					

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
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  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
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# Public Input No. 1706-NFPA 70-2023 [New Section after 770.3]

#### 770.9 Qualified Persons.

The installation and testing of fiber optic cables shall be done by Qualified Persons.

Informational Note: See definition of Qualified Person in Article 100.

#### Statement of Problem and Substantiation for Public Input

Technology in the limited energy and communications system segments of the electrical industry is rapidly evolving and expanding and is becoming more complicated. These systems require far more training and experience. These systems are often part of essential electrical systems and critical operations power systems requiring a greater degree of training and experience, in design, planning, installation, and programing in many instances. These systems and others require trained qualified personnel and contractors. ANSI standards address these systems and include requirements that qualified persons perform installations of these systems and equipment, so these new NEC requirements are proposed to correlate and align with those ANSI-accredited industry standards and codes. Licensing and regulatory agencies are developing new examinations and will be updating existing exams for state and other licensing to increase qualification credentials related to growth and advancement in this segment of the electrical industry. Certification organizations have indicated they anticipate following the same course of action. Qualified contractors and installers are a crucial element of safety related to these installations and systems.

#### **Related Public Inputs for This Document**

#### **Related Input**

Public Input No. 1708-NFPA 70-2023 [New Section after 800.3] Public Input No. 1701-NFPA 70-2023 [New Section after 760.3] Public Input No. 1698-NFPA 70-2023 [New Section after 726.3] Public Input No. 1695-NFPA 70-2023 [New Section after 725.3] Public Input No. 1694-NFPA 70-2023 [New Section after 724.3] Public Input No. 1690-NFPA 70-2023 [New Section after 722.3] Public Input No. 1686-NFPA 70-2023 [New Section after 708.8] Public Input No. 1684-NFPA 70-2023 [New Section after 701.7] Public Input No. 1672-NFPA 70-2023 [New Section after 700.8] Public Input No. 4394-NFPA 70-2023 [New Section after 625.6] Public Input No. 1629-NFPA 70-2023 [New Section after 393.6] Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)] Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)] Public Input No. 1629-NFPA 70-2023 [New Section after 393.6] Public Input No. 1672-NFPA 70-2023 [New Section after 700.8] Public Input No. 1684-NFPA 70-2023 [New Section after 701.7] Public Input No. 1686-NFPA 70-2023 [New Section after 708.8] Public Input No. 1690-NFPA 70-2023 [New Section after 722.3] Public Input No. 1694-NFPA 70-2023 [New Section after 724.3] Public Input No. 1695-NFPA 70-2023 [New Section after 725.3] Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]

#### **Relationship**

Public Input No. 1	701-NFPA 70-2023 [New Section after 760.3]
Public Input No. 1	708-NFPA 70-2023 [New Section after 800.3]
Public Input No. 4	<u>394-NFPA 70-2023 [New Section after 625.6]</u>
Submitter Informa	tion Verification
Submitter Full Na	me: Kyle Krueger
Organization:	NECA
Affiliation:	NECA
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Fri Jul 28 20:46:22 EDT 2023
Committee:	NEC-P16
Committee Staten	nent
<b>Resolution:</b> The insta cable	definition of a Qualified Person in Article 100 references "electrical equipment and llations"; which is for installers of electric light and power circuits, not optical fiber es.

and Substantiation for Public Input
of circuit integrity (CI) cables installed in a raceway or cables of fire- ms shall be installed in accordance with their listing.
or each type of electrical cable.
ables shall be classified as electrical cables in accordance with the type of They shall be constructed, listed, and marked in accordance with the
300.22(A) for wiring systems shall apply to conductive optical fiber cables.
cts for Dust, Loose Stock, or Vapor Removal.
ables shall be permitted to be installed in hazardous (classified) locations. sealed in accordance with 501.15, 502.15, 505.16, or 506.16, as applicable.
assified) Locations.
br Products of Combustion.
al fiber cables shall comply with 770.3(A) through (D). Only those sections ticle 300 referenced in this article shall apply to optical fiber cables.

Public II	nput No. 3377-NFPA 70-2023 [ Section No. 770.3(A) ]
<b>(A)</b> Haza	ardous (Classified) Locations.
Listed op <u>as stated</u> 502.15, 5	tical fiber cables shall be permitted to be installed in hazardous (classified) locations <u>elsewhere in this Code</u> . The cables shall be sealed in accordance with 501.15, 05.16, or 506.16, as applicable.
Statement of	Problem and Substantiation for Public Input
Chapter 7 ar purview of C fiber optic ca this languag	ticles don't state the hazardous (classified) area requirements as they are under the MP14 and located in Chapter 5. As such, it is recommended to revise the text to state the bles are allowed as stated elsewhere in the code to avoid the purview problem created by e in this section. 501, 502, 505, and 506 clearly state the allowances accordingly.
Submitter Inf	ormation Verification
Submitter F	ull Name: Richard Holub
Organizatio	n: The DuPont Company, Inc.
Street Addre	955:
State:	
Zip:	
Submittal D	ate: Fri Sep 01 15:48:20 EDT 2023
Committee:	NEC-P16
Committee St	atement
Resolution:	FR-7611-NFPA 70-2024
Statement:	This editorial change has been made to avoid implying that hazardous location requirements are the purview of Article 770. With the multitude of conditions and environments that are involved in identifying the proper hazardous (classified) locations, the individual sections of Chapter 5 cannot be referenced and instead the user is directed to all of Chapter 5.



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<ul> <li>770.21 - Access to Electrical Equipment Behind Panels Designed to Allow Access:</li> <li>Access to electrical equipment shall not be denied by an accumulation of optical fiber cables that prevents removal of panels, including suspended ceiling panels.</li> <li>770.24 - Mechanical Execution of Work.</li> <li>(A) - General:</li> <li>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 such a manner that the cable will not be damaged by normal building use. Such cables shall secured by hardware, including straps; staples; cable ties listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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 accordance with 800.170 :</li> <li>Informational Note No. 1: See ANSI/NECA/FOA 301-2016, <i>Standard for Installing and Testing Fiber Optic Cables</i>, ANSI/TIA-568.0-D-2015, <i>Generic Telecommunications Cabling for Customer Premises</i>, and ANSI/TIA 563.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 563.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling of Contonner Premises</i>, and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling of Contonner Network</i>, <i>Conditioning and Ventiliting Systems</i>, for discrete combustible components installed accordance with 300.22(C):</li> <li>Informational Note No.</li></ul>	Sections 770.21, 770	<del>.24, 770.25, 770.26</del>
Access to electrical equipment shall not be denied by an accumulation of optical fiber cables that prevents removal of panels, including suspended ceiling panels. <b>770:24</b> – Mechanical Execution of Work: <b>(A)</b> – General: 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 such a manner that the cable will not be damaged by normal building use. Such cables shall secured by hardware, including straps; staples; cable ties listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum cable ties and other normetallic cable accessories used to secure and support cables in other spaces used for normetallic cable accessories used to secure and support cables. In the release properties accordance with 800.170 - Informational Note No. 1: See ANSI/NECA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables , ANSI/TIA-568.0-D-2015, Generic Telecommunications Cabling for Customer Premises , and ANSI/TIA 563.0-D-2016, Optical Fiber Cabling et Components Standard , for accepted industry practices. Informational Note No. 2: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems , for discrete combustible components installed accordance with 300.22(C) : Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or ot contaminants may result in an undetermined alteration of optical fiber cable spoperties of the state of the noncombustible surface of the building structure. Cable supports and fasteners shall be steel. <b>770.25</b> Abandoned Cables: The accessible portion of abandoned optical fiber cables shall be removed. Where cables and identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.	770.21 Access to Ele	ectrical Equipment Behind Panels Designed to Allow Access.
<ul> <li>770.24 - Mechanical Execution of Work.</li> <li>(A) - General:</li> <li>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 such a manner that the cable will not be damaged by normal building use. Such cables shall secured by hardware, including straps; staples; cable ties listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11Plenum cable ties and othen 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 accordance with 800.170 :</li> <li>Informational Note No. 1: See ANSI/NECA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables , ANSI/TIA-568.0-D-2015, Generic Telecommunications Cabling for Customer Premises , and ANSI/TIA 568.3-D-2016, Optical Fiber Cabling et Components Standard , for accepted industry practices.</li> <li>Informational Note No. 2: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems , for discrete combustible components installed accordance with 300.22(C) :</li> <li>Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or ot contaminants may result in an undetermined alteration of optical fiber cable sported at a distance not exceeding 610 mm (24 in.).C shall be seed.</li> <li>770.25 - Abandoned Cables.</li> <li>The accessible portion of abandoned optical fiber cables shall be removed. Where cables and identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.</li> </ul>	Access to electrical ec that prevents removal	uipment shall not be denied by an accumulation of optical fiber cables of panels, including suspended ceiling panels.
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<ul> <li>Informational Note No. 1: See ANSI/NECA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables, ANSI/TIA-568.0-D-2015, Generic Telecommunications Cabling for Customer Premises, and ANSI/TIA 568.3-D-2016, Optical Fiber Cabling &amp; Components Standard, for accepted industry practices.</li> <li>Informational Note No. 2: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, for discrete combustible components installed accordance with 300.22(C).</li> <li>Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or ot contaminants may result in an undetermined alteration of optical fiber cable properties</li> <li>(B) Circuit Integrity (CI) Cable.</li> <li>Circuit Integrity (CI) cable shall be supported at a distance not exceeding 610 mm (24 in.).C shall be secured to the noncombustible surface of the building structure. Cable supports and fasteners shall be steel.</li> <li>770.25 Abandoned Cables.</li> <li>The accessible portion of abandoned optical fiber cables shall be removed. Where cables and identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.</li> </ul>	Optical fiber cables sh exposed on the surfac such a manner that the secured by hardware, and support; and hang cable. The installation nonmetallic cable accord environmental air (plei accordance with 800.	all be installed in a neat and workmanlike manner. Cables installed e of ceilings and sidewalls shall be supported by the building structure e cable will not be damaged by normal building use. Such cables shal including straps; staples; cable ties listed and identified for secureme jers, or similar fittings, designed and installed so as not to damage the shall also conform to 300.4 and 300.11. Plenum cable ties and other provides used to secure and support cables in other spaces used for nums) shall be listed as having low smoke and heat release propertie 170 -
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The accessible portion of abandoned optical fiber cables shall be removed. Where cables a identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.	770.25 Abandoned (	<del>Cables.</del>
	The accessible portior identified for future use environment involved.	r of abandoned optical fiber cables shall be removed. Where cables a ∋ with a tag, the tag shall be of sufficient durability to withstand the

#### 770.26 - Spread of Fire or Products of Combustion.

Installations of optical fiber 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 optical fiber 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 770.26 can be found in building codes, fire resistance directories, and product listings.

#### **Additional Proposed Changes**

File Name Limited Energy TG First Draft Substantiation.docx Description First Draft Substantiation **Approved** 

#### Statement of Problem and Substantiation for Public Input

This text is being deleted as part of the reorganization of the limited energy articles. The deleted text is relocated as a general requirement to new Article X00.

#### **Submitter Information Verification**

Submitter Full Name: Mark HilbertOrganization:MR Hilbert Insp. & TrainingStreet Address:Image: City:City:Image: City:State:Image: City:Zip:Image: City: City:Submittal Date:Sun Sep 03 06:08:03 EDT 2023Committee:NEC-P16

#### **Committee Statement**

**Resolution:** A considerable part of the text from Article 770 Sections 24, and Section 26 in its entirety, is not relocated but deleted from the referenced new Article X00 under PI 3234. There is no technical justification supplied for the deletion of these requirements. For clarity, and ease-of-use it is more appropriate to have as many requirements as practical for optical fiber systems explicitly in one article (namely 770).

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



(A) General. Optical fiber cables shall be installed in a new exposed on the surface of ceilings and sidew such a manner that the cable will not be dan secured by hardware, including straps; stapl	<del>at and workmanlike manner.</del> Cables installed
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Informational Note No. 1: See ANSI/NI Testing Fiber Optic Cables, ANSI/TIA- Cabling for Customer Premises, and A Components Standard, for accepted in	ECA/FOA 301-2016, <i>Standard for Installing and</i> 568.0-D-2015, <i>Generic Telecommunications</i> NSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling a</i> idustry practices.
Informational Note No. 2: See NFPA 9 <i>Conditioning and Ventilating Systems</i> , accordance with 300.22(C).	0A-2021, <i>Standard for the Installation of Air-</i> for discrete combustible components installed i
Informational Note No. 3: Paint, plaste contaminants may result in an undeter	r, cleaners, abrasives, corrosive residues, or otl mined alteration of optical fiber cable properties
(B) <u>Workmanship.</u>	
Optical fiber cables shall be mechanically with industry practices and standards.	y executed and installed in a manner consis
Informational Note No. 1: See definition of	o <u>f_Workmanship_in Article 100.</u>
Informational Note No. 2: See Section 110	0.12 for more information on Workmanship.
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<u>(C) Circuit Integrity (CI) Cable.</u>	
Circuit integrity (CI) cable shall be supported shall be secured to the noncombustible surfa fasteners shall be steel.	at a distance not exceeding 610 mm (24 in.).C ace of the building structure. Cable supports and
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See Companion PIs pertaining to Sections:

- Article 100 Definition of "Workmanship"
- 110.12

- 393.24
- 600.24
- 600.33(B) 724.22
- 724.24725.24
- 725.24
  726.24
- 760.24
- 800.24

# **Related Public Inputs for This Document**

#### **Related Input**

#### **Relationship**

Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work Surface.] Public Input No. 1596-NFPA 70-2023 [Section No. 110.12] Public Input No. 1630-NFPA 70-2023 [Section No. 393.14] Public Input No. 1632-NFPA 70-2023 [New Section after 393.21] Public Input No. 1669-NFPA 70-2023 [New Section after 600.24] Public Input No. 1668-NFPA 70-2023 [Section No. 600.24] Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)] Public Input No. 1687-NFPA 70-2023 [Section No. 722.24] Public Input No. 1692-NFPA 70-2023 [New Section after 724.21] Public Input No. 1691-NFPA 70-2023 [Section No. 724.24] Public Input No. 1696-NFPA 70-2023 [New Section after 725.21] Public Input No. 1697-NFPA 70-2023 [Section No. 725.24] Public Input No. 1699-NFPA 70-2023 [New Section after 726.12] Public Input No. 1700-NFPA 70-2023 [Section No. 726.24] Public Input No. 1702-NFPA 70-2023 [Section No. 760.24] Public Input No. 1709-NFPA 70-2023 [Section No. 800.24] Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work Surface.] Public Input No. 1596-NFPA 70-2023 [Section No. 110.12] Public Input No. 1630-NFPA 70-2023 [Section No. 393.14] Public Input No. 1632-NFPA 70-2023 [New Section after 393.21] Public Input No. 1668-NFPA 70-2023 [Section No. 600.24] Public Input No. 1669-NFPA 70-2023 [New Section after 600.24] Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)] Public Input No. 1687-NFPA 70-2023 [Section No. 722.24] Public Input No. 1692-NFPA 70-2023 [New Section after 724.21] Public Input No. 1696-NFPA 70-2023 [New Section after 725.21] Public Input No. 1697-NFPA 70-2023 [Section No. 725.24] Public Input No. 1699-NFPA 70-2023 [New Section after 726.12] Public Input No. 1700-NFPA 70-2023 [Section No. 726.24] Public Input No. 1702-NFPA 70-2023 [Section No. 760.24] Public Input No. 1709-NFPA 70-2023 [Section No. 800.24]

# **Submitter Information Verification**

Submitter Full Name: Kyle Krueger

NECA
NECA
Fri Jul 28 20:51:46 EDT 2023
NEC-P16

### **Committee Statement**

**Resolution:** The proposed requirements and term "workmanship" is ambiguous and unenforceable since "workmanship" is not a defined term in Article 100.

(A) General.	
Optical fiber cab Cables installed building structur Such cables sha identified for sec as not to damag cable ties and o spaces used for release propertie	es shall be installed in a neat professional and workmanlike skillful manner exposed on the surface of ceilings and sidewalls shall be supported by the a in such a manner that the cable will not be damaged by normal building use ll be secured by hardware, including straps; staples; cable ties listed and urement and support; and hangers, or similar fittings, designed and installed s the cable. The installation shall also conform to 300.4 and 300.11. Plenum her nonmetallic cable accessories used to secure and support cables in other environmental air (plenums) shall be listed as having low smoke and heat is in accordance with 800.170.
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manual of style. The section in NFPA 90A dealing with discrete products was added to

#### improve usability.

The first sentence in 770.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Section 770.24(A) has also been subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

# Public Input No. 19-NFPA 70-2023 [ Section No. 770.24(A) ]

#### (A) General.

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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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.

Informational Note No. 1: See ANSI/NECA/FOA 301-2016, *Standard for Installing and Testing Fiber Optic Cables*, 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*, for accepted industry practices.

Informational Note No. 2: See NFPA 90A<del>-2021</del>, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, <u>8.5.5.6</u> for <u>listing infomation of</u> 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.

#### Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 will be moved to 8.5.5.6 in the next (2024) edition of NFPA 90A.

#### **Related Public Inputs for This Document**

Related Input	
Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]	
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]	
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]	
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]	
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(	<u>2)]</u>
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(	<u>[2)]</u>
Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]	
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(	<u>2)]</u>
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(	<u>[2)]</u>
Public Input No. 26-NFPA 70-2023 [Section No. 800.170]	
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]	
Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]	
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]	

#### **Relationship**

Revise NFPA 90A reference Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)] Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)] Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)] Public Input No. 26-NFPA 70-2023 [Section No. 800.170] Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]

### Submitter Information Verification

Submitter Full Name	: Stanley Kaufman
Organization:	CableSafe, Inc./OFS
Affiliation:	Plastics Industry Association (PLASTICS)
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed Jan 04 10:58:12 EST 2023
Committee:	NEC-P16

#### **Committee Statement**

**Resolution:** FR-7615-NFPA 70-2024

Statement: The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

> The first sentence in 770.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Section 770.24(A) has also been subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

### Public Input No. 2014-NFPA 70-2023 [ Section No. 770.24(A) ] (A) General. Optical fiber cables shall be installed in a neat professional and workmanlike manner skillful 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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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. Informational Note No. 1: See ANSI/NECA/FOA 301-2016. Standard for Installing and Testing Fiber Optic Cables, 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, for accepted industry practices. Informational Note No. 2: See NFPA 90A-2021, 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. Statement of Problem and Substantiation for Public Input This revision is needed to correlate with the wording in 110.12 **Related Public Inputs for This Document Related Input Relationship** Public Input No. 2009-NFPA 70-2023 [Section "professional and skillful" instead of "neat and No. 722.24(A)] workmanlike" Public Input No. 2010-NFPA 70-2023 [Section "professional and skillful" instead of "neat and No. 724.24] workmanlike" Public Input No. 2011-NFPA 70-2023 [Section "professional and skillful" instead of "neat and No. 725.241 workmanlike" Public Input No. 2012-NFPA 70-2023 [Section "professional and skillful" instead of "neat and No. 726.24] workmanlike" "professional and skillful" instead of "neat and Public Input No. 2013-NFPA 70-2023 [Section No. 800.24(A)] workmanlike" Public Input No. 2015-NFPA 70-2023 [Section No. 600.33(B)] Public Input No. 2016-NFPA 70-2023 [Section No. 393.14(A)] Public Input No. 2017-NFPA 70-2023 [Section <u>No. 760.24(A)</u> Submitter Information Verification

Submitter F	III Name: Russ Leblanc
Organizatio	Leblanc Consulting Services
Street Addre	ss:
City:	
State:	
Zip:	
Submittal Da	ate: Fri Aug 11 06:46:11 EDT 2023
Committee:	NEC-P16
Committee St	atement
<b>Resolution:</b>	FR-7615-NFPA 70-2024
Statement:	The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.
	The first sentence in 770.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Section 770.24(A) has also been subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

(A) General.		
Optical fiber cab Cables installed building structure Such cables sha identified for sec as not to damag cable ties and of spaces used for release propertie	eles shall be installed in a neat pro exposed on the surface of ceilings e in such a manner that the cable all be secured by hardware, includi curement and support; and hanger the cable. The installation shall ther nonmetallic cable accessories e environmental air (plenums) shall es in accordance with 800.170.	<u>ofessional</u> and <u>workmanlike</u> <u>skillful</u> manners is and sidewalls shall be supported by the will not be damaged by normal building us ing straps; staples; cable ties listed and is, or similar fittings, designed and installed also conform to 300.4 and 300.11. Plenum is used to secure and support cables in othe be listed as having low smoke and heat
Information Testing Fil Cabling fo Componer	nal Note No. 1: See ANSI/NECA/F ber Optic Cables, ANSI/TIA-568.0- r Customer Premises, and ANSI/T nts Standard, for accepted industr	<sup>E</sup> OA 301-2016, <i>Standard for Installing and</i> D-2015, <i>Generic Telecommunications</i> IA 568.3-D-2016, <i>Optical Fiber Cabling an</i> y practices.
Information <i>Conditioni</i> accordanc	nal Note No. 2: See NFPA 90A-20 ing and Ventilating Systems, for dis se with 300.22(C).	21, <i>Standard for the Installation of Air-</i> screte combustible components installed ir
Information contamina	nal Note No. 3: Paint, plaster, clea	ners, abrasives, corrosive residues, or oth
		alteration of optical fiber cable properties
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Submitter Full Name: Lowell Reith

Organization Affiliation:	Interstates Construction Servi
Street Addre	SS:
State:	
Zip:	
Submittal Da	Ate: Fri Aug 18 12:31:30 EDT 2023
Committee:	NEC-P16
Committee St	atement
<b>Resolution:</b>	FR-7615-NFPA 70-2024
Statement:	The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.
	The first sentence in 770.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.
	Section 770.24(A) has also been subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

A	
(A) General.	
Optical fiber cable exposed on the s such a manner the secured by hardward and support; and cable. The install ties and other not used for environing properties in acc	es shall be installed in a neat and workmanlike manner. Cables installed surface of ceilings and sidewalls shall be supported by the building structure in nat the cable will not be damaged by normal building use. Such cables shall be ware, including straps; staples; cable ties listed and identified for securement I hangers, or similar fittings, designed and installed so as not to damage the lation shall also conform to 300.4- and , 300.11 and 334.30. Plenum cable nmetallic cable accessories used to secure and support cables in other space mental air (plenums) shall be listed as having low smoke and heat release ordance with 800.170.
Informatior Testing Fib Cabling for Componer	hal Note No. 1: See ANSI/NECA/FOA 301-2016, <i>Standard for Installing and</i> <i>ther Optic Cables</i> , ANSI/TIA-568.0-D-2015, <i>Generic Telecommunications</i> <i>Customer Premises</i> , and ANSI/TIA 568.3-D-2016, <i>Optical Fiber Cabling and</i> <i>the Standard</i> , for accepted industry practices.
Informatior <i>Conditionir</i> accordance	nal Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air- ng and Ventilating Systems</i> , for discrete combustible components installed in e with 300.22(C).
Informatior contaminal	nal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other nots may result in an undetermined alteration of optical fiber cable properties.
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# Committee Statement

**Resolution:** The installation requirements for NMB do not apply to optical fiber cable.

Г

(A) General.				
Optical fiber cab exposed on the such a manner t secured by hard and support; and cable. The instal nonmetallic cabl environmental a accordance with	les shall be installed in a neat and workmanlike manner. Cables installed surface of ceilings and sidewalls shall be supported by the building structure in that the cable will not be damaged by normal building use. Such cables shall be ware, including straps; staples; cable ties listed and identified for securement d hangers, or similar fittings, designed and installed so as not to damage the llation shall also conform to 300.4 and 300.11. Plenum cable ties and other e accessories used to secure and support cables in other spaces used for ir (plenums) shall be listed as having low smoke and heat release properties in 800.170.			
Information industry pr	nal Note No. 1: See <u>the following standards for more information on accepted</u> ractices related to optical fiber installations:_			
<u>(1)</u> ANSI/I	(1)_ANSI/NECA/FOA 301 <del>-2016</del> , <i>Standard for Installing and Testing Fiber Optic Cables</i> <del>,</del>			
- <u>(2)</u> ANSI/ <sup>-</sup> Premises <del>,</del>	- <u>(2)</u> ANSI/TIA-568.0-D <del>-2015</del> , <i>Generic Telecommunications Cabling for Customer</i> Premises <del>, and</del>			
<u>(3)</u> ANSI/ <sup>-</sup> <del>accepted i</del>	ΓΙΑ 568.3-D <del>-2016</del> , <i>Optical Fiber Cabling and Components Standard<del>, for</del> <del>ndustry practices.</del></i>			
Information <i>Conditioni</i> accordanc	nal Note No. 2: See NFPA 90A <del>-2021</del> , <i>Standard for the Installation of Air- ng and Ventilating Systems</i> , for discrete combustible components installed in with 300.22(C).			
Information contamina	nal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other Ints may result in an undetermined alteration of optical fiber cable properties.			
atement of Probl	em and Substantiation for Public Input			
Revised information be maintained refer	nal Note removing the date to maintain shelf life of the reference. The reference v ring to the most recently published edition of the standard. tion Verification			
Submitter Full Nan	<b>ne:</b> Kyle Krueger			
Submitter Full Nan Organization:	ne: Kyle Krueger NECA			
Submitter Full Nan Organization: Affiliation:	ne: Kyle Krueger NECA NECA			
Submitter Full Nan Organization: Affiliation: Street Address:	ne: Kyle Krueger NECA NECA			
Submitter Full Nan Organization: Affiliation: Street Address: City:	ne: Kyle Krueger NECA NECA			
Submitter Full Nan Organization: Affiliation: Street Address: City: State:	ne: Kyle Krueger NECA NECA			
Submitter Full Nan Organization: Affiliation: Street Address: City: State: Zip:	ne: Kyle Krueger NECA NECA			
Submitter Full Nan Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee:	ne: Kyle Krueger NECA NECA Thu Sep 07 15:26:49 EDT 2023 NEC-P16			

the manual of style.

# Public Input No. 57-NFPA 70-2023 [ Section No. 770.24(A) ]

#### (A) General.

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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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.

Informational Note No. 1: See ANSI/NECA/FOA 301-2016, *Standard for Installing and Testing Fiber Optic Cables*, 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*, for accepted industry practices.

Informational Note No. 2: See NFPA 90A-2021, *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.

#### Statement of Problem and Substantiation for Public Input

Article 770 is not exempt from 90.3 or Article 110. Therefore, the requirements of Article 110 apply to Chapter 7 of the NEC. Accordingly, there is no need to restate the requirements of 110.12 in 770.24(A) that "optical fiber cables shall be installed in a professional and skillful manner." Further, in addition to there being no need to repeat general requirements from Article 110 here in this section, the requirements in this section do not comply with the NEC Style Manual since it was determined that "neat" and "workmanlike" were vague and unenforceable and were therefore changed to "professional" and "skillful" in 110.12. In sum, this sentence should be removed because it is unnecessary as it is redundant per 90.3, there is lack of correlation with 110.12, and it is in violation of the NEC Style Manual.

#### **Submitter Information Verification**

Submitter Full Name: Palmer Hickman				
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Street Address:				
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Submittal Date:	Fri Jan 06 17:43:27 EST 2023			
Committee:	NEC-P16			

#### **Committee Statement**

Resolution: FR-7615-NFPA 70-2024

**Statement:** The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

The first sentence in 770.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Section 770.24(A) has also been subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

770.26 Spread	For Fire or Products of Combustion.
Installations of c shafts, and vent products of com optical fiber cab floors, or ceiling rating.	optical fiber cables and communications raceways in hollow spaces, vertical ilation or air-handling ducts shall be made so that the possible spread of fire or ibustion will not be substantially increased. Openings around penetrations of les and communications raceways through fire-resistant–rated walls, partitions, s shall be firestopped using approved methods to maintain the fire resistance
Informatio	nal Note: Directories of electrical construction materials published by qualified
testing lab	poratories contain many listing installation restrictions necessary to maintain the
fire-resisti	ve rating of assemblies where penetrations or openings are made. Building
codes also	o contain restrictions on membrane penetrations on opposite sides of a fire
resistance	e-rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal
separation	n that usually applies between boxes installed on opposite sides of the wall.
Assistance	e in complying with 770.26 -can be found in building codes, fire resistance
directories	s, and product listings.
separation	that usually applies between boxes installed on opposite sides of the wall.
Assistance	e in complying with 770.26 can be found in building codes, fire resistance
directories	s, and product listings.
separation	that usually applies between boxes installed on opposite sides of the wall.
Assistance	e in complying with 770.26 -can be found in building codes, fire resistance
directories	a, and product listings.
tement of Probl	Iem and Substantiation for Public Input
Submitted another	public input to add spread of fire to 770.3. Removing this requirement will improv
usability and add cl	arity for Code users.
separation	that usually applies between boxes installed on opposite sides of the wall.
Assistance	e in complying with 770.26 can be found in building codes, fire resistance
directories	a, and product listings.
tement of Probl	Iem and Substantiation for Public Input
Submitted another	public input to add spread of fire to 770.3. Removing this requirement will improv
usability and add cl	arity for Code users.
Submitter Full Nar	<ul> <li>that usually applies between boxes installed on opposite sides of the wall.</li> <li>in complying with 770.26 can be found in building codes, fire resistance</li> <li>and product listings.</li> <li>lem and Substantiation for Public Input</li> <li>public input to add spread of fire to 770.3. Removing this requirement will improv arity for Code users.</li> <li>tion Verification</li> </ul>
separation Assistance directories tement of Probles Submitted another usability and add cle bmitter Informate Submitter Full Nar Organization: Street Address: City: State: Zin:	<ul> <li>that usually applies between boxes installed on opposite sides of the wall.</li> <li>in complying with 770.26 can be found in building codes, fire resistance</li> <li>and product listings.</li> </ul>
Submitted another usability and add cl bmitter Informat Submitter Full Nar Organization: Street Address: City: State: Zip: Submittal Date:	<ul> <li>that usually applies between boxes installed on opposite sides of the wall.</li> <li>in complying with 770.26 can be found in building codes, fire resistances, and product listings.</li> <li>lem and Substantiation for Public Input</li> <li>public input to add spread of fire to 770.3. Removing this requirement will improvarity for Code users.</li> <li>tion Verification</li> <li>ne: Mike Holt</li> <li>Mike Holt Enterprises Inc</li> </ul>

not been adopted.

NEW CC	NEW CONTENT in Part II.					
<u>770.43 L</u>	sted Optical Fiber Cab	les in Outdoo	<u>r Cable Trays.</u>			
<u>Optical fil</u> <u>cables, T</u> <u>Type OF(</u> <u>Type OF</u> [	<u>per cables installed in ou</u> <u>ype OFN-sunlight resista</u> <u>CG-sunlight resistant, Ty</u> <u>NP-sunlight resistant or </u>	<u>itdoor cable tra ant, Type OFC- pe OFNR-sunli Type OFCP-sui</u>	<u>ys shall be listed indoor/outdoor optical fiber</u> <u>sunlight resistant, Type OFNG-sunlight resistant,</u> <u>ight resistant, Type OFCR-sunlight resistant,</u> <u>nlight resistant.</u>			
<u>Information permit "se</u>	<u>nal Note: The listing rec</u> <u>unlight resistant" to be al</u>	<u>quirements for i</u> bbreviated "sur	indoor/outdoor optical fiber cables (770.179G) <u>res".</u>			
Statement of	Problem and Subs	tantiation fo	or Public Input			
provisions for Related Public	r a cable that's used in c	ocument	rays. The PI fixes that omission.			
<u>Public Input</u> <u>No. 770.179</u> <u>Public Input</u> <u>No. 770.179</u>	<u>Related Input</u> <u>No. 2568-NFPA 70-2023</u> ] <u>No. 2568-NFPA 70-2023</u> ]	3 [Section 3 [Section	Relationship Listing requirements for indoor/outdoor optic fiber cables			
Submitter Inf	ormation Verificatio	วท				
Submitter F	ull Name: David Kiddoo	Organization: CCCA				
Submitter F Organizatio	ull Name: David Kiddoo 1: CCCA					
Submitter F Organizatio Affiliation: Street Addre City: State: Zip:	ull Name: David Kiddoo n: CCCA Communicatio	ons Cable & Co	onnectivity Association			
Submitter F Organizatio Affiliation: Street Addre City: State: Zip: Submittal D Committee:	ull Name: David Kiddoo n: CCCA Communicatio ess: ate: Tue Aug 22 10 NEC-P16	ons Cable & Co 0:44:21 EDT 20	onnectivity Association			
Submitter F Organizatio Affiliation: Street Addro City: State: Zip: Submittal D Committee St	ull Name: David Kiddoo n: CCCA Communicatio ess: ate: Tue Aug 22 10 NEC-P16	ons Cable & Co 0:44:21 EDT 20	onnectivity Association 023			
Submitter F Organizatio Affiliation: Street Addro City: State: Zip: Submittal D Committee:	ull Name: David Kiddoo n: CCCA Communicatio sss: ate: Tue Aug 22 10 NEC-P16 catement FR-7639-NFPA 70-202	ons Cable & Co 0:44:21 EDT 20	onnectivity Association 023			

# Public Input No. 419-NFPA 70-2023 [ Section No. 770.44(A)(4) ]

#### (4) Clearance.

Supply service drops <u>utility drops</u> and sets of overhead service conductors of 0 to 750 volts running above and parallel to optical fiber cable service drops <u>utility drops</u> shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of 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.

# Statement of Problem and Substantiation for Public Input

This PI is associated with several other PIs to recommend a global change from "service drop" to "utility drop" and from "service lateral" to "utility lateral." "Service drop" appears 23 times in the Code and "service lateral" appears 15 times. There are 11 definitions that begin with the word 'service.' Of these, 9 are customer owned and only "service drop" and "service lateral" are utility owned and, therefore, outside the scope of the Code. "service drops" and "service laterals" are not service conductors as they do not fit the definition. Confining the word "service" to only those items that are customer owned would clear up much confusion on this topic. Appendix A shows UL 523 as having the title "telephone service drop wire" and the UL standard does, in fact, have that title. However, the text of UL 523 defines this wire as customer owned and Article 805 refers to this wire as a "drop wire."

# **Related Public Inputs for This Document**

#### Related Input

Public Input No. 411-NFPA 70-2023 [Section No. 90.2(D)]

Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]

Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]

Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po...]

Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]

Public Input No. 416-NFPA 70-2023 [Section No. 800.44(A)(4)]

Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]

Public Input No. 418-NFPA 70-2023 [Section No. 701.12(F)]

Public Input No. 420-NFPA 70-2023 [Section No. 770.44(B)]

Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]

Public Input No. 422-NFPA 70-2023 [Section No. 230.40]

Public Input No. 423-NFPA 70-2023 [Section No. 250.24(A)(1)]

#### **Relationship**

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

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Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Public Input No. 42 250.24(F)]	24-NFPA 70-2023 [Section No.	Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'
Public Input No. 42 250.64(D)(1)]	25-NFPA 70-2023 [Section No.	Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'
Public Input No. 42 250.66 [Excluding	26-NFPA 70-2023 [Section No. anv Sub-Sections]]	Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'
Public Input No. 41 90.2(D)]	11-NFPA 70-2023 [Section No.	
Public Input No. 41	2-NFPA 70-2023 [Definition:	
Public Input No. 41	3-NFPA 70-2023 [Definition:	
Public Input No. 41 Distribution Point (	4-NFPA 70-2023 [Definition: Center Yard Pole) (Meter	
Public Input No. 41 Service Lateral.]	5-NFPA 70-2023 [Definition:	
Public Input No. 41 800.44(A)(4)]	6-NFPA 70-2023 [Section No.	
Public Input No. 41 700.12(F)]	7-NFPA 70-2023 [Section No.	
Public Input No. 41 701.12(F)]	8-NFPA 70-2023 [Section No.	
Public Input No. 42 770.44(B)]	20-NFPA 70-2023 [Section No.	
Public Input No. 42 230.24(A)]	21-NFPA 70-2023 [Section No.	
Public Input No. 42 230.40]	22-NFPA 70-2023 [Section No.	
Public Input No. 42 250.24(A)(1)]	23-NFPA 70-2023 [Section No.	
Public Input No. 42 250.24(F)]	24-NFPA 70-2023 [Section No.	
Public Input No. 42 250.64(D)(1)]	25-NFPA 70-2023 [Section No.	
Public Input No. 42 250.66 [Excluding	26-NFPA 70-2023 [Section No. any Sub-Sections]]	
mitter Informat	tion Verification	
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Zip:		
Submittal Date:	Sat Mar 04 16:44:35 EST 2023	

# **Committee Statement**

Committee:

NEC-P16

Resolution: FR-7687-NFPA 70-2024

**Statement:** To provide consistent terminology throughout the section, the term "supply service drops" was changed to "electric light or power conductors".
## Public Input No. 420-NFPA 70-2023 [ Section No. 770.44(B) ]

#### (B) 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: The requirement of 770.44(B) 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 optical fiber cable service drop <u>utility drop</u> cable passes above the roof overhang, and (2) 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: See ANSI/IEEE C2-2017, *National Electric Safety Code, Part 2, Safety Rules for Overhead Lines*, for additional information regarding overhead wires and cables.

## Statement of Problem and Substantiation for Public Input

This PI is associated with several other PIs to recommend a global change from "service drop" to "utility drop" and from "service lateral" to "utility lateral." "Service drop" appears 23 times in the Code and "service lateral" appears 15 times. There are 11 definitions that begin with the word 'service.' Of these, 9 are customer owned and only "service drop" and "service lateral" are utility owned and, therefore, outside the scope of the Code. "service drops" and "service laterals" are not service conductors as they do not fit the definition. Confining the word "service" to only those items that are customer owned would clear up much confusion on this topic. Appendix A shows UL 523 as having the title "telephone service drop wire" and the UL standard does, in fact, have that title. However, the text of UL 523 defines this wire as customer owned and Article 805 refers to this wire as a "drop wire."

## **Related Public Inputs for This Document**

#### Related Input

Public Input No. 411-NFPA 70-2023 [Section No. 90.2(D)]

Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]

Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]

Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po...]

Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]

Public Input No. 416-NFPA 70-2023 [Section No. 800.44(A)(4)]

Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]

Public Input No. 418-NFPA 70-2023 [Section No. 701.12(E)]

#### **Relationship**

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

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Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

	Public Input No. 419-NFPA 70-2023 [Section No. 770.44(A)(4)]
	Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]
	Public Input No. 422-NFPA 70-2023 [Section No. 230.40]
	Public Input No. 423-NFPA 70-2023 [Section No. 250.24(A)(1)]
	Public Input No. 424-NFPA 70-2023 [Section No. 250.24(F)]
	<u>Public Input No. 425-NFPA 70-2023 [Section No. 250.64(D)(1)]</u>
	Public Input No. 426-NFPA 70-2023 [Section No. 250.66 [Excluding any Sub-Sections]]
Ç	Public Input No. 411-NFPA 70-2023 [Section No. 90.2(D)]
	Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]
	Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]
	Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po]
	Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]
	Public Input No. 416-NFPA 70-2023 [Section No. 800.44(A)(4)]
	Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]
	Public Input No. 418-NFPA 70-2023 [Section No. 701.12(F)]
	<u>Public Input No. 419-NFPA 70-2023 [Section No. 770.44(A)[4]</u>
	Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]
	Public Input No. 422-NFPA 70-2023 [Section No. 230.40]
	Public Input No. 423-NFPA 70-2023 [Section No. 250.24(A)(1)]
	Public Input No. 424-NFPA 70-2023 [Section No. 250.24(F)]
	Public Input No. 425-NFPA 70-2023 [Section No. 250.64(D)(1)]
	Public Input No. 426-NFPA 70-2023 [Section No. 250.66 [Excluding any Sub-Sections]]
	witten Information Varifiantion

Submitter Full Name: Eric StrombergOrganization:Los Alamos National LaboratoryAffiliation:SelfStreet Address:

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

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Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

City:	
State:	
Zip:	
Submittal Date:	Sat Mar 04 16:47:01 EST 2023
Committee:	NEC-P16

## **Committee Statement**

Resolution: FR-7690-NFPA 70-2024

**Statement:** "Optical fiber cable service drop cable" was simplified to "optical fiber cable" to improve clarity. The reference to the National Electrical Safety code has been updated.

77	<b>0.48</b> Unlisted Cables Entering Buildings.
<del>(A</del>	)- Conductive and Nonconductive Cables.
Un be use cal the	l <del>isted conductive and nonconductive outside plant optical fiber cables shall be permitted to installed in building spaces, other than risers, ducts used for environmental air, plenums ed for environmental air, and other spaces used for environmental air, where the length of t be within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and cable enters the building from the outside and is terminated in an enclosure.</del>
<del>Th</del> ₩a <del>co</del> i	e point of entrance shall be permitted to be extended from the penetration of the external II, roof, or floor slab by continuously enclosing the entrance optical fiber cables in rigid meta aduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.
	Informational Note: Splice cases or terminal boxes, both metallic and plastic types, typically are used as enclosures for splicing or terminating optical fiber cables.
<del>(В</del>	) Nonconductive Cables in Raceway.
<del>Un</del> <del>fro</del>	l <del>isted nonconductive outside plant optical fiber cables shall be permitted to enter the buildi m the outside and shall be permitted to be installed in any of the following raceways:</del>
(1)	Intermediate metal conduit (IMC)
(2)	Rigid metal conduit (RMC)
(3)	Rigid polyvinyl chloride conduit (PVC)
(4)	Electrical metallic tubing (EMT)

plenums used for environmental air, and other spaces used for environmental air.

## Statement of Problem and Substantiation for Public Input

Article 770, Optical Fiber Cables, despite being in Chapter 7, is written as a communications article. Just like Article 800, it has provisions for unlisted outside plant cables to enter the building for up to 50 feet. It doesn't have any requirements for outside plant wiring because it assumes that outside plant wiring is covered by the National Electrical Safety Codes.

In contrast to the communications Articles, Article 722, provides for the listing and use of Type PLTC, power-limited tray cable, which is outdoor rated Class 3 cable that is suitable to be installed in outdoor cable trays, an installation pathway that is common in refineries.

Since Article 770 is written as a communications Article, it has no provision for a listed cable suitable for use in outdoor cable trays.

This PI and companion PIs introduce listing and installation requirements for optical fiber cables listed for use in outdoor cable trays. These PIs coordinate with a series of PIs that bring optical fiber cables into Article 800 in order to improve usability by having all the cables use for communications, both optical fiber and metallic conductor in Article 800.

This PI deletes 770.48, Unlisted Cables Entering Buildings, because communications applications are the only applications that utilize unlisted optical fiber cables. PI 1131 provides for the requirements of

770.48 to be moved into section 800.48 and consolidated with similar requirements for unliste	d
communications cables and unlisted CATV-type coaxial cables.	

## **Related Public Inputs for This Document**

Related Input
Public Input No. 1131-NFPA 70-2023 [Section No.
800.48
Public Input No. 1131-NFPA 70-2023 [Section No.
<u>800.48]</u>

<u>Relationship</u> Adds optical fiber cables for completeness

## **Submitter Information Verification**

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Submittal Date:	Tue Aug 22 06:58:20 EDT 2023			
Committee:	NEC-P16			

## **Committee Statement**

Resolution: FR-7691-NFPA 70-2024

**Statement:** Section 770.48 has been deleted with its requirements incorporated into 800.48. See separate action taken on 800.48.

(A) Con	ductive and Nonconductive Cables.
Unlisted of be installo used for of cable with the cable <u>enclosure</u> <u>length d</u> o	conductive and nonconductive outside plant optical fiber cables shall be permitted to ed in building spaces, other than risers, ducts used for environmental air, plenums environmental air, and other spaces used for environmental air, where the length of the hin the building, measured from its point of entrance, does not exceed 15 m (50 ft) and enters the building from the outside and is terminated in an enclosure without the use of pull or junction boxes and in which the cable opes not exceed 150'.
The point wall, roof conduit (F	t of entrance shall be permitted to be extended from the penetration of the external , or floor slab by continuously enclosing the entrance optical fiber cables in rigid metal RMC) or intermediate metal conduit (IMC) to the point of emergence.
Infc typi	prmational Note: Splice cases or terminal boxes, both metallic and plastic types, ically are used as enclosures for splicing or terminating optical fiber cables.
The existing and end use After speakir cable. I belie	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. ng directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed.
The existing and end use After speakir cable. I belie	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. ng directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed.
The existing and end use After speakir cable. I belie Submitter Info Submitter F	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. ng directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed. <b>ormation Verification</b> <b>ull Name:</b> David Foster
The existing and end use After speakir cable. I belie Submitter Info Submitter F Organization Street Addre	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. ng directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed. <b>ormation Verification</b> <b>ull Name:</b> David Foster <b>n:</b> Burns & McDonnell <b>ess:</b>
The existing and end use After speakin cable. I belie Submitter Info Submitter F Organization Street Addre City:	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. ng directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed. <b>ormation Verification</b> <b>ull Name:</b> David Foster <b>n:</b> Burns & McDonnell <b>ess:</b>
The existing and end use After speakir cable. I belie Submitter Info Submitter F Organization Street Addre City: State: Zip:	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. Ing directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed. <b>ormation Verification</b> <b>ull Name:</b> David Foster <b>n:</b> Burns & McDonnell <b>ess:</b>
The existing and end use After speakir cable. I belie Submitter Info Submitter F Organization Street Addre City: State: Zip: Submittal D	wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. In directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive eve the modified wording will help end the discussions as to what is allowed. <b>cormation Verification</b> <b>ull Name:</b> David Foster <b>n:</b> Burns & McDonnell <b>ess:</b>
The existing and end use After speakin cable. I belie Submitter Info Submitter F Organization Street Addre City: State: Zip: Submittal Da Committee:	<ul> <li>wording has lead to a semantics debate between Engineers, Code Enforcement officials rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. Ing directly with the NFPA, the intent is to not allow any pull points with unlisted, conductive we the modified wording will help end the discussions as to what is allowed.</li> <li>ormation Verification</li> <li>ull Name: David Foster</li> <li>n: Burns &amp; McDonnell</li> <li>pess:</li> <li>ate: Thu Sep 07 12:57:06 EDT 2023 NEC-P16</li> </ul>
The existing and end use After speakir cable. I belie Submitter Info Submitter F Organization Street Addre City: State: Zip: Submittal Di Committee St	wording has lead to a semantics debate between Engineers, Code Enforcement official rs (Owners) as to what constitutes a "continuous" installation to the point of emergence. Ing directly with the NFPA, the intent is to not allow any pull points with unlisted, conduction eve the modified wording will help end the discussions as to what is allowed. <b>ormation Verification</b> <b>ull Name:</b> David Foster n: Burns & McDonnell ess: ate: Thu Sep 07 12:57:06 EDT 2023 NEC-P16





# Public Input No. 20-NFPA 70-2023 [ Section No. 770.113(B)(2) ]

## (2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in ducts specifically fabricated for environmental air as described in 300.22(B).

Informational Note: See NFPA 90A<del>-2021</del>, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, <u>Chapter 10</u>, <u>Electrical and Optical Fiber Wiring and Equipment</u> in <u>Plenums and Ducts</u> for information on fire protection of wiring installed in fabricated ducts.

## Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

The current edition of NFPA 90A, the 2024 edition, has been significantly reorganized. In previous editions, electrical requirements for installation in ducts and plenums were in Chapter 4, HVAC Systems. The 2024 edition has a new Chapter 10, Electrical and Optical Fiber Wiring and Equipment in Plenums and Ducts. Consequently, Informational Notes referencing electrical requirements in NFPA 90A need to be revised.

## **Related Public Inputs for This Document**

Related Input

Public Input No. 11-NFPA 70-2023 [Section No. 645.4] Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)] Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)] Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)] Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)] Public Input No. 26-NFPA 70-2023 [Section No. 800.170] Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)] Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)] Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)] Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]

## **Relationship**

Revise NFPA 90A reference Revise NFPA 90A reference

Public Input No. 25-	NFPA 70-2023 [Section No. 800.113(C)(2)]			
Public Input No. 26-	NFPA 70-2023 [Section No. 800.170]			
Public Input No. 27-	NFPA 70-2023 [Section No. 800.182(A)]			
Submitter Informati	on Verification			
Submitter Full Nam	e: Stanley Kaufman			
Organization:	CableSafe, Inc./OFS			
Affiliation:	Plastics Industry Association (PLASTICS)			
Street Address:				
City:				
State:				
Zip:				
Submittal Date:	Wed Jan 04 11:01:23 EST 2023			
Committee:	NEC-P16			
Committee Statement				
Resolution: FR-77	<u>32-NFPA 70-2024</u>			
Statement: Revise	d informational note to align with the NEC style manual and added a reference to 30A, Chapter 10 for user clarity.			

# Public Input No. 21-NFPA 70-2023 [ Section No. 770.113(C)(2) ]

#### (2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A<del>-2018</del>, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, <u>Chapter 10</u>, Electrical and Optical Fiber Wiring and Equipment in Plenums and Ducts. for information on fire protection of wiring installed in other spaces used for environmental air.

## Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

The next edition of NFPA 90A, the 2024 edition, will be significantly reorganized. In the current (2021) and previous editions, electrical requirements for installation in ducts and plenums were in Chapter 4, HVAC Systems. The 2024 edition will have a new Chapter 10, Electrical and Optical Fiber Wiring and Equipment in Plenums and Ducts. Consequently, Informational Notes referencing electrical requirements in NFPA 90A need to be revised.

## **Related Public Inputs for This Document**

**Related Input** Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)] Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)] Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)] Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)] Public Input No. 26-NFPA 70-2023 [Section No. 800.170] Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)] Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)] Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)] Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)] Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]

## **Relationship**

Revise NFPA 90A reference Revise NFPA 90A reference

Public Input	t No. 26-NFPA 70-2023 [Section No. 800.170]
Public Input	<u> No. 27-NFPA 70-2023 [Section No. 800.182(A)]</u>
Submitter Inf	ormation Verification
Submitter F	ull Name: Stanley Kaufman
Organizatio	n: CableSafe, Inc./OFS
Affiliation:	Plastics Industry Association (PLASTICS)
Street Addr	ess:
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State:	
Zip:	
Submittal D	ate: Wed Jan 04 11:03:52 EST 2023
Committee:	NEC-P16
Committee S	tatement
Resolution:	FR-7735-NFPA 70-2024
Statement:	Revised informational note to align with the NEC style manual and added a reference to NFPA 90A, Chapter 10 for user clarity.

<del>770.114</del>	Ground	ing.		
Non-current-carrying conductive members of optical fiber cables shall be bonded to a grounded equipment rack or enclosure, or grounded in accordance with the grounding methods specified by 770.100(B) using a conductor specified in 770.100(A).				
tatement of	Proble	m and Substantiation for Public Input		
With the crea	ation of A	rticle 770.108 within PI 4072, Article 770.114 can	be deleted as it is duplicative.	
elated Publi	c Input	ts for This Document		
Public Input	<u>No. 407:</u>	Related Input 2-NFPA 70-2023 [New Section after 770.106]	<u>Relationship</u> Dependent	
ubmitter Inf	ormatio	on Verification		
Submitter F	ull Name	: Jeff Silveira		
Organizatio	1:	Bicsi		
Street Addre	SS:			
City:				
State:				
7:	ato:	Wed Sep 06 15:42:03 EDT 2023		
Zip: Submittal D	ne.	NEC-P16		
Zip: Submittal D Committee:				
Zip: Submittal D Committee:	atemei	nt		
Zip: Submittal D Committee: committee St Resolution:	atemei	<b>nt</b> 2-NFPA 70-2024		

## Public Input No. 3445-NFPA 70-2023 [ Sections NFPA 770.133(A), 770.133(B), 770.133(C) ]

#### Sections 770.133(A), 770.133(B), 770.133(C)

(A) In Cable Trays and Raceways.

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 for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits, unless 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.

(B) In Cabinets, Outlet Boxes, and Similar Enclosures.

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 unless one or more of the following conditions exist:

- (1) The nonconductive optical fiber cables are functionally associated with the electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit.
- (2) The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operate at 1000 volts or less.
- (3) The nonconductive optical fiber cables and the electrical terminations of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit are installed in factory- or field-assembled control centers.
- (4) The nonconductive optical fiber cables are installed in an industrial establishment where conditions of maintenance and supervision ensure that only qualified persons service the installation.

When optical fibers are within the same hybrid cable for electric light, power, Class 1, nonpower-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.

Optical fibers in hybrid 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.

Optical fibers in hybrid optical fiber cables containing current-carrying conductors for electric light, power, or Class 1 circuits rated over 1000 volts 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 in industrial establishments, where conditions of maintenance and supervision ensure that only qualified persons service the installation.

	<del>(C)</del>	- With Other	<del>Circuits.</del>			
	Conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:					
	(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725					
	(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760					
	(3) Communications circuits in compliance with Parts I and V of Article 805					
	(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					
Addi	tiona	al Propose	d Changes			
			File Name	<b>Description</b>	<u>Approved</u>	
L	imited	I_Energy_TG	_First_Draft_Substantiation.docx	First Draft Substantiation		
State	emen	t of Proble	em and Substantiation for	Public Input		
TI re	This text is being deleted as part of the reorganization of the limited energy articles. The deleted text is relocated as a general requirement to new Article X00.					
Subn	nitte	r Informati	on Verification			
Si	ubmit	ter Full Nam	e: Mark Hilbert			
0	rganiz	zation:	MR Hilbert Insp. & Training			
St	treet A	Address:				
Ci	ity:					
St	tate:					
Zi	ip:					
S	ubmit	tal Date:	Sun Sep 03 06:11:59 EDT 202	3		
C	ommi	ttee:	NEC-P16			
Com	Committee Statement					
R	<b>Resolution:</b> The text from Article 770 is not relocated but greatly shortened and altered in the Section X00.100 of the new proposed Article X00 under PI 3234. There is no technical justification supplied for the technical changes to the text.					

## **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



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tray, box, enclosure, or cable routing assembly, with conductors of any of the following: Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance <i>i</i> th 645.5(E)(2) or Parts I and II of Article 725 <u>Class 4 fault managed power circuits in compliance with 645.5(E)(2) and Parts I and II of <u>vrticle 726</u> Power-limited fire alarm systems in compliance with Parts I and III of Article 760 Communications circuits in compliance with Parts I and V of Article 805 Community antenna television and radio distribution systems in compliance with Parts I nd V of Article 820</u>
Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance vith 645.5(E)(2) or Parts I and II of Article 725 <u>Class 4 fault managed power circuits in compliance with 645.5(E)(2) and Parts I and II of viticle 726</u> vower-limited fire alarm systems in compliance with Parts I and III of Article 760 Communications circuits in compliance with Parts I and V of Article 805 Community antenna television and radio distribution systems in compliance with Parts I nd V of Article 820
<u>Class 4 fault managed power circuits in compliance with 645.5(E)(2) and Parts I and II of viticle 726</u> Power-limited fire alarm systems in compliance with Parts I and III of Article 760 Communications circuits in compliance with Parts I and V of Article 805 Community antenna television and radio distribution systems in compliance with Parts I nd V of Article 820
Power-limited fire alarm systems in compliance with Parts I and III of Article 760 Communications circuits in compliance with Parts I and V of Article 805 Community antenna television and radio distribution systems in compliance with Parts I nd V of Article 820
Communications circuits in compliance with Parts I and V of Article 805 Community antenna television and radio distribution systems in compliance with Parts I nd V of Article 820
Community antenna television and radio distribution systems in compliance with Parts I nd V of Article 820
_ow-power network-powered broadband communications circuits in compliance with Parts and V of Article 830
Information Verification
er Full Name: Chad Jones
er Full Name: Chad Jones Ition: Cisco Systems
er Full Name: Chad Jones ation: Cisco Systems address:
er Full Name: Chad Jones ation: Cisco Systems ddress:
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er Full Name: Chad Jones ation: Cisco Systems ddress:
artion:       Cisco Systems         ddress:       Ved Sep 06 10:40:19 EDT 2023         ee:       NEC-P16
ar Full Name: Chad Jones   ation:   Cisco Systems   ddress:   Il Date: Wed Sep 06 10:40:19 EDT 2023 ee: NEC-P16 Statement

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Public Input N	lo. 4035-NFPA 70-2023 [ Section No. 770.133(C) ]
(C) With Other	Circuits.
Listed Conductive tray, box, enclosur	and nonconductive optical fiber cables shall be permitted in the same raceway, cable re, or cable routing assembly
<del>,</del> <u>with</u> <del>conductors of</del> <u>any of the followi</u>	<u>ng:</u>
(1) <u>Listed Class</u> circuits in com	<u>2 and Class 3 remote-control, signaling, and power-limited</u> <del>pliance with 645.5(E)(2) or Parts I and II of Article 725</del>
(2) <u>cables</u>	
(3) Listed Class 4	cables
<u>(3) Listed</u>	Power-limited fire alarm
systems in com	oliance with Parts I and III of Article 760
Communicat <u>cables</u>	ions circuits in compliance with Parts I and V of Article 805
<u>(4) Listed</u>	Communications cables
<u>(5) Listed</u>	Community antenna television and radio distribution
<del>systems in com</del> <u>system coaxial</u>	oliance with Parts I and V of Article 820 cables_
<u>(6) Listed</u>	Low-power network-powered broadband communications
circuits in compl cables	iance with Parts I and V of Article 830
• Changes to ref state in compliance Article)	em and Substantiation for Public Input flect these are listed cables and other readability improvements (e.g., no need to with the installation rules of the Article, as already required for cabling under that
Submitter Informat	ion Verification
Submitter Full Nam	ne: Jeff Silveira
Organization:	Bicsi
Street Address:	
City:	
State:	
Submittal Date:	Wed Sep 06 14:38:54 EDT 2023
Committee:	NEC-P16

## **Committee Statement**

Resolution: FR-7767-NFPA 70-2024

**Statement:** Revision reflects that cables must be listed and other readability improvements and class 4 cables have been added because they are allowed to be routed within the same raceway as the circuits covered within the 770.133.

(C)	With Other <del>Circuits</del> <u>Cables</u> .
<del>Cor</del> san the	tductive Listed conductive and nonconductive optical fiber cables shall be permitted in the ne raceway, cable tray, box, enclosure, or cable routing assembly, with <del>conductors of</del> any of following:
(1)	<u>Listed</u> Class 2 and Class 3 remote-control, signaling, and power-limited <del>circuits</del> <u>cables</u> <u>installed</u> in compliance with 645.5(E)(2); or <u>Article 722, Part I, and Article 725</u> , Parts I ar II- <del>of Article 725</del>
(2)	
(2)	
(3)	Listed Class 4 cables installed in compliance with Article 722, Part I, and Article 726, Part and II
(4) <del>Co</del>	<u>Listed power</u> -limited fire alarm systems <u>cables installed</u> in compliance with <u>Article 760,</u> Parts I and III- <del>of Article 760</del> ommunications circuits
(5)	
(6)	Listed communications cables installed in compliance with <u>Article 800</u> , Parts I and <del>V of Article 805</del>
	- NA
(1)	<u>IV</u>
(8) <del>Le</del>	Listed community_antenna television and radio distribution systems <u>coaxial cables installi</u> in compliance with <u>Article 800,</u> Parts I and <del>V of</del> <u>III, and</u> Article 820
(0)	Parts Land V
(3)	
(10)	) <u>Listed low</u> -power network-powered broadband communications <del>circuits</del> <u>cables installed</u>

The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 770.133(A)(1).

In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3, Class 4 and fire alarm cables, which are always listed.

Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". "Circuits" was changed to "cables" to clarify that this section is about which cables are permitted to be run together in the same pathway.

The installation rules for communications cables were moved from Article 805 to Article 800 in the 2023 NEC.

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number."

## **Related Public Inputs for This Document**

Related Input Public Input No. 818-NFPA 70-2023 [Section No. 726.139]

Public Input No. 817-NFPA 70-2023 [Section No. 725.139]

Public Input No. 826-NFPA 70-2023 [Section No. 830.133(A)(1)]

Public Input No. 895-NFPA 70-2023 [Section No. 760.139]

Public Input No. 899-NFPA 70-2023 [Section No. 800.133(A)(1)]

Public Input No. 817-NFPA 70-2023 [Section No. 725.139]

Public Input No. 818-NFPA 70-2023 [Section No. 726.139]

Public Input No. 895-NFPA 70-2023 [Section No. 760.139]

### **Relationship**

Provide for dual listing.

Correlate with 726.139 Class 4 cable requirements

## **Submitter Information Verification**

Submitter Full Name: David Kiddoo

Organization:	CCCA
Affiliation:	Communications Cable & Connectivity Association
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City:	
State:	
Zip:	
Submittal Date:	Fri Jun 02 08:17:22 EDT 2023
Committee:	NEC-P16

## **Committee Statement**

**Resolution:** <u>FR-7767-NFPA 70-2024</u> **Statement:** Revision reflects that cables n

**Statement:** Revision reflects that cables must be listed and other readability improvements and class 4 cables have been added because they are allowed to be routed within the same raceway as the circuits covered within the 770.133.

# Public Input No. 2568-NFPA 70-2023 [ Section No. 770.179 ]

770.179 Optical Fiber Cables.

Optical fiber cables shall be listed and identified in accordance with 770.179(A) through ( $G \underline{H}$ ) 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). The temperature rating shall be marked on the jacket of optical fiber cables that have a temperature rating exceeding 60°C (140°F).

Informational Note: See UL 1651-2015, *Standard for Optical Fiber Cable, for information on optical fiber cables.* 

Table 770.179 Cable Markings

Cable Marking	Туре
OFNP	Nonconductive optical fiber plenum cable
OFCP	Conductive optical fiber plenum cable
OFNR	Nonconductive optical fiber riser cable
OFCR	Conductive optical fiber riser cable
OFNG	Nonconductive optical fiber general-purpose cable
OFCG	Conductive optical fiber general-purpose cable
OFN	Nonconductive optical fiber general-purpose cable
OFC	Conductive optical fiber general-purpose cable

(A) Types OFNP and OFCP.

Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be suitable for use in ducts, plenums, and other space used for environmental air and shall also have adequate fire-resistant and low-smoke-producing characteristics.

Informational Note: See NFPA 262-2019, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, for one method of defining that a cable has adequate fire-resistant and low-smoke-producing characteristics where 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.

(B) Types OFNR and OFCR.

Types OFNR and OFCR nonconductive and conductive optical fiber riser cables shall be suitable for use in a vertical run in a shaft or from floor to floor and shall also have the fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See ANSI/UL 1666-2017, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*, for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

## (C) Types OFNG and OFCG.

Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be suitable for general-purpose use, with the exception of risers and plenums, and shall also be resistant to the spread of fire

Informational Note No. 1: See CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), *Test Methods for Electrical Wires and Cables*, for one method of defining *resistant to the spread of fire* for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the test.

Informational Note No. 2: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray *Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for another method of defining *resistant to the spread of fire* where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

(D) Types OFN and OFC.

Types OFN and OFC nonconductive and conductive optical fiber cables shall be suitable for general-purpose use, with the exception of risers, plenums, and other spaces used for environmental air, and shall also be resistant to the spread of fire.

Informational Note No. 1: See ANSI/UL 1685-2015, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for one method of defining *resistant to the spread of fire* where the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test. The smoke measurements in the test method are not applicable.

Informational Note No. 2: See CSA Vertical Flame Test — Cables in Cables Trays, as described in CSA C22.2 No. 0.3-2009 (R2019), *Test Methods for Electrical Wires and Cables*, for another method of defining *resistant to the spread of fire* where the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

Informational Note No. 3: Cable types are listed in descending order of fire resistance rating. Within each fire resistance rating, nonconductive cable is listed first because it is often substituted for conductive cable.

(E) Circuit Integrity (CI), Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall meet either 770.179(E)(1), (E)(2), or (E)(3).

(1) Circuit Integrity (CI) Cables.

Cables specified in 770.179(A) through (D), and used for survivability of critical circuits, shall be marked with the additional classification using the suffix "Cl." In order to maintain its listed fire rating, CI cable shall only be installed in free air in accordance with 770.24. CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 770.179(E)(2).

Informational Note: See UL 2196, *Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for one method of defining CI cable for establishing a minimum 2-hour fire resistance rating for the cable as specified in UL 1651, *Optical Fiber Cable*. UL *Guide Information for Optical Cable Fiber (QAYK)* contains information to identify the cable and its installation limitations to maintain the fire-resistive rating.

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	(2) Fire-Resistive Cables.		
	Cables specified in 770.179(A) through (D) and 770.179(E)(1) that a circuit protective system shall be fire-resistive cable and identified wi number on the product or on the smallest unit container in which the installed in accordance with the listing of the protective system.	re part of an electrical th the protective system product is packaged and	
	Informational Note: See UL 2196, Standard for Fire Test for Cil Resistive Power, Instrumentation, Control and Data Cables, fo an electrical circuit protective system for establishing a rating f Information for Electrical Circuit Integrity Systems (FHIT) conta the system and its installation limitations to maintain a minimur	rcuit Integrity of Fire- r one method of defining or the system. UL <i>Guide</i> nins information to identify n fire-resistive rating.	
	(F) Field-Assembled Optical Fiber Cables.		
	Field-assembled optical fiber cable shall comply with the following:		
	(1) The specific combination of jacket and optical fibers intended to assembled optical fiber cable shall be one of the types in 770.17 be marked in accordance with Table 770.179.	be installed as a field- 79(A), (B), or (D) and shall	
	(2) The jacket of a field-assembled optical fiber cable shall have a the specific optical fibers with which it is identified for use.	surface marking indicating	
	(3) The optical fibers shall have a permanent marking, such as a m jacket with which they are identified for use.	narker tape, indicating the	
	(4) The jacket without fibers shall meet the listing requirements for in 800.182(A), (B), or (C) in accordance with the cable marking.	communications raceways	
(G) Indoor/Outdoor Optical Fiber Cables			
	Indoor/outdoor optical fiber cables shall be one of the following types OFCG, OFNR, OFCR, OFNP and OFCP that are also listed as sunlig one of the following types: Type OFN-sunlight resistant, OFC-sunlight sunlight resistant, Type OFCG-sunlight resistant, Type OFNR-sunlight sunlight resistant, Type OFNP-sunlight resistant or Type OFCP-sunlight abbreviation "sun res" shall be permitted as an alternate to "sunlight	<u>. OFN, OFC, OFNG,</u> ght resistant and marked as nt resistant, Type OFNG- nt resistant, Type OFCR- ght resistant. The resistant".	
	( <u>H)</u> Optional Markings.		
	Cables shall be permitted to be surface marked to indicate special cl materials.	naracteristics of the cable	
	Informational Note: These markings can include, but are not lir limited-smoke halogen-free, low-smoke halogen-free, and sun	nited to, markings for ight resistance.	
Staten	ement of Problem and Substantiation for Public Input		
Thi cab inde	his is a companion PI to PI 2567 which requires listed indoor/outdoor of able trays. The recommended text of this PI establishes the listing required not on optical fiber cables. ted Public Inputs for This Document	optical fiber cables in outdoor lirements for listed	
	Delete d levert	Deletienskin	
<u>Pu</u> Se	Public Input No. 2567-NFPA 70-2023 [New Requires inst Section after 770.27] fiber cables	allation of indoor/outdoe optical	
<u>Pu</u> Se	Public Input No. 2567-NFPA 70-2023 [New Section after 770.27]		
Subm	mitter Information Verification		

Submitter Full Name: David Kiddoo

Organization Affiliation: Street Addre City: State: Zip:	n: CCCA Communications Cable & Connectivity Association
Submittal Da Committee: Committee St	ate: Tue Aug 22 10:57:53 EDT 2023 NEC-P16 atement
Resolution:	This has not been adopted since there are no listings in the standard, UL 1651, for outdoor Optical optical





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B) 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 -

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

The requirements of 300.22(A) shall apply.

(D) - Equipment in Other Space Used for Environmental Air.

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

E) Installation and Use.

The requirements of 110.3(B) shall apply.

(F) Optical Fiber Cable.

Where optical fiber cable is used to provide a communications circuit within a building, Article <u>770</u> shall apply.

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G) Vertical Support for Fire-Resistive Cables and Conductors.

Vertical installations of circuit integrity (CI) cables and conductors installed in a raceway or conductors and cables of fire-resistive cable systems shall be installed in accordance with 300.19.

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H) Bonding and Grounding of Cable Shields.

The requirements of 250.4(A)(5) shall apply to the metal shields of cables used for communications.

800.21 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.

800.24 Mechanical Execution of Work.

(A) General.

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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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.

Informational Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568.1- E-2020, Commercial Building Telecommunications Infrastructure Standard; ANSI/TIA-569-E-2019, 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-179-A-2017, Healthcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966-2014, Telecommunications Infrastructure Standard for Educational Facilities; and other ANSI-approved installation standards for accepted industry practices.

Informational Note No. 2: See NFPA 90A-2021, 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.

(B) - Circuit Integrity (CI) Cable.

CI cable shall be supported at a distance not exceeding 610 mm (24 in.). Cable shall be secured to the noncombustible surface of the building structure. Cable supports and fasteners shall be steel.

#### 800.25 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.

#### 800.26 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 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.

Part II. Wires and Cables Outside and Entering Buildings

800.44 Overhead (Aerial) Wires and Cables.

<u>Overhead (aerial) communications wires and cables and CATV-type coaxial cables entering</u> <u>buildings shall comply with 800.44(A) through (D).</u>

Informational Note: See ANSI C2-2017, National Electrical Safety Code, Part 2 Safety Rules for Overhead Lines, for additional information regarding overhead (aerial) wires and cables.

(A) On Poles, In-Span, Above Roofs, on Masts, or Between Buildings.

If communications wires and cables or CATV-type 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 800.44(A)(1) through (A)(4) shall be met.

(1) Relative Location.

<u>If practicable, the communications wires and cables and CATV- type coaxial cables shall be</u> located below the electric light or power conductors.

(2) Attachment to Cross-Arms.

<u>Communications wires and cables and CATV-type coaxial cables shall not be attached to a cross-arm that carries electric light or power conductors.</u>

(3) Climbing Space.

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

(4) Clearance.

Supply service drops and sets of overhead service conductors of 0 volts to 750 volts running above and parallel to communications wires and cables and CATV-type coaxial service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of 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.

<u>Communications wires and cables and CATV-type 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.</u>

<u>Exception No. 1:</u> <u>Communications wires and cables and CATV-type coaxial cables shall</u> 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 (1) not more than 1.2 m (4 ft) of communications and CATV-type service-drop conductors pass above the roof overhang and (2) they are terminated at a through- or above-the-roof raceway or approved support.

<u>Exception No. 3:</u> 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: See ANSI/IEEE C2-2017, National Electrical Safety Code, Part 2, Safety Rules for Overhead Lines, for additional information regarding overhead (aerial) wire and cables.

(C) On Masts.

<u>Overhead (aerial) communications wires and cables and CATV-type coaxial cables shall be</u> permitted to be attached to an above-the-roof raceway mast that does not enclose or <u>support conductors of electric light or power circuits.</u>

## (D) Between Buildings.

<u>Communications and CATV-type coaxial cables extending between buildings or structures,</u> 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.

<u>Exception:</u> If a communications cable or a CATV-type 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.

<u>Where attached to buildings, communications wires and cables and CATV-type coaxial</u> <u>cables shall be securely fastened in such a manner that they will be separated from other</u> <u>conductors in accordance with 800.44(E)(1) and (E)(2).</u>

(1) Electric Light or Power.

The communications wires and cables and CATV-type coaxial cables 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 nonconductive barrier in addition to the insulation on the wires.

(2) Other Communications Systems.

<u>Communications wires and cables and CATV-type coaxial cables shall be installed so that</u> there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the wires, cables, messenger strand, or equipment of one system cause abrasion to the wires, cables, messenger strand, or equipment of any other system.

800.47 Underground Systems Entering Buildings.

<u>Underground communications wires and cables, CATV-type coaxial cables, and network-powered broadband communications cables entering buildings shall comply with 800.47(A) and (B). The requirements of 310.10(C) shall not apply to communications wires and cables and CATV-type coaxial cables.</u>

(A) Underground Systems with Electric Light, Power, Class 1, or Non-Power-Limited Fire Alarm Circuit Conductors.

<u>Underground communications wires and cables, CATV-type coaxial cables, and network-powered broadband communications cables in a raceway, pedestal, handhole enclosure, or manhole containing electric light, power, Class 1, or non-power-limited fire alarm circuit conductors shall be in a section separated from such conductors by means of brick, concrete, or tile partitions or by means of a suitable barrier.</u>

### (B) Direct-Buried Cables and Raceways.

<u>Direct-buried communications wires and cables, CATV-type coaxial cables, and network-powered broadband communications cables shall be separated at least 300 mm (12 in.)</u> from conductors of any light or power, non-power-limited fire alarm circuit conductors, or Class 1 circuit.

<u>Exception No. 1:</u> <u>Separation shall not be required if electric service conductors or all the direct-buried communications wires and cables, CATV-type coaxial cables, and network-powered broadband communications cables are installed in raceways or have metal cable armor.</u>

Exception No. 2: Separation shall not be required under one of the following conditions:

- (1) If the electric light or power branch-circuit or feeder conductors or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF or Type USE cables
- (2) <u>If all the direct-buried communications wires cables, CATV-type coaxial cables, and</u> <u>network-powered broadband communications cables have metal cable armor or are</u> <u>installed in raceway</u>

### 800.48 Unlisted Cables Entering Buildings.

Unlisted outside plant communications cables and unlisted outside plant CATV-type 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 if all of the following applies:

- (1) <u>The length of the cable within the building, measured from its point of entrance, does</u> not exceed 15 m (50 ft).
- (2) <u>The cable enters the building from the outside.</u>
- (3) <u>The unlisted outside plant communications cable is terminated in an enclosure or on a listed primary protector, or the unlisted outside plant CATV type coaxial cable is terminated at a grounding block.</u>

The point of entrance shall be permitted to be extended from the penetration of the external wall, roof, 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 communications cables.

Informational Note No. 2: This section limits the length of unlisted outside plant cable to 15 m (50 ft) from the point of entrance, while 805.90(B) requires that the primary protector be located as close as practicable to the point of entrance of the cable. Therefore, in installations requiring a primary protector, the outside plant cable may not extend 15 m (50 ft) into the building if it is practicable to place the primary protector closer to the point of entrance.

## 800.49 Metal Entrance Conduit Grounding.

<u>Metal conduit containing entrance wire or cable shall be connected by a bonding conductor</u> <u>or grounding electrode conductor to a grounding electrode or, where present, the building</u> <u>grounding electrode system in accordance with 800.100(B)</u>.

## 800.53 Separation from Lightning Conductors.

<u>Where practicable on buildings, a separation of at least 1.8 m (6 ft) shall be maintained</u> <u>between lightning protection conductors and all communications wires and cables and</u> <u>CATV-type coaxial cables.</u>

Informational Note No. 1: See ANSI C2-2017 National Electrical Safety Code, Part 2, Safety Rules for Overhead Lines, for additional information regarding overhead (aerial) wires and cables.

Informational Note No. 2: See NFPA 780-2020, Standard for the Installation of Lightning Protection Systems, for information on calculation of separation distances using the sideflash equation.

Part III. Grounding Methods

800.100 Cable and Primary Protector Bonding and Grounding.

(A) Bonding Conductor or Grounding Electrode Conductor.

(1) Insulation.

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

#### (2) Material.

The bonding conductor or grounding electrode conductor shall be copper or other corrosionresistant 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 have a current-carrying capacity not less than the aggregate of the grounded metal cable sheath member, the metal strength member(s), and the protected conductor(s) of the communications cable, or the outer sheath of the coaxial cable, as applicable. 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. See ANSI/TIA-607-D-2019, *Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises,* which includes useful information to reduce such voltages.

<u>Exception:</u> In one- and two-family dwellings if 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 800.100(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 800.100(C), and the 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. If 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), (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.

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.

<u>Figure Informational Note Figure 800.100(B)(1) Illustration of a Bonding Conductor</u> <u>in a Communications Installation Equipped With an Intersystem Bonding</u> <u>Termination or Terminal Block Providing Access To the Building Grounding Means.</u>



(2) In Buildings or Structures with Grounding Means.

If an intersystem bonding termination is established, <u>250.94(A)</u> 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) <u>The power service accessible means external to enclosures using the options identified</u> in <u>250.94(A)</u>, <u>Exception</u>
- (3) The nonflexible metal power service raceway
- (4) The service equipment enclosure
- (5) <u>The grounding electrode conductor or the grounding electrode conductor metal</u> <u>enclosure of the power service</u>
- (6) <u>The grounding electrode conductor or the grounding electrode of a building or structure</u> <u>disconnecting means that is connected to a grounding electrode as covered in 250.32</u>
- (7) <u>The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of</u> <u>entrance to the building, as covered in 250.52</u>

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 located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means connected to an electrode by a grounding electrode conductor in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

<u>Informational Note:</u> <u>See</u> <u>Informational Note Figure 800.100(B)(2)</u> for an illustration of a grounding electrode conductor and a bonding conductor in a communications installation not equipped with an intersystem bonding termination or terminal block.</u>

Figure Informational Note Figure 800.100(B)(2) Illustration of a Grounding Electrode Conductor and a Bonding Conductor in a Communications Installation Not Equipped with an Intersystem Bonding Termination or Terminal Block Providing Access to the Building Grounding Means.



<u>(3)</u>	In Buildings	s or Struc	tures Witl	<u>nout an Ir</u>	<u>ntersystem</u>	<b>Bonding</b>	Termination	<u>or Grounding</u>
Mea	<u>ins.</u>							

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 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 <u>800.100(B)(2) or (B)(3)(1)</u>, to any one of the individual grounding electrodes described in <u>250.52(A)(5)</u>, (A)(7), and (A)(8)
- (3) For communications circuits covered in Article <u>805</u> or network-powered broadband communications systems covered in Article <u>830</u>, to a ground rod or pipe not less than <u>1.5 m (5 ft) in length and 12.7 mm (0.5 in.) in diameter, driven, where practicable, into</u> permanently damp earth and separated from lightning protection system conductors, as covered in <u>800.53</u>, and at least <u>1.8 m (6 ft) from electrodes of other systems</u>

<u>Steam pipes, hot water pipes, or lightning protection system conductors shall not be</u> <u>employed as grounding electrodes or as a bonding or grounding electrode conductor for</u> <u>protectors and grounded metal members.</u>

(C) Electrode Connection.

Connections to grounding electrodes shall comply with 250.70.

(D) Bonding of Electrodes.

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

Exception: Bonding of electrodes at mobile homes shall be in accordance with 800.106.

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.

800.106 Primary Protector Grounding and Bonding at Mobile Homes.

(A) Grounding.

Grounding shall comply with 800.106(A)(1) and (A)(2).

(1) Mobile Home Service Equipment.

Where there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, grounding shall comply with one of the following:

- (1) <u>The following components (if present) shall be connected to a grounding electrode in accordance with 800.100(B)(3):</u>
  - (2) Primary protector grounding terminal
  - (3) Network interface unit
  - (4) Coaxial cable shield ground
  - (5) Surge arrester grounding terminal
  - (6) Network-powered broadband communications cable shield
  - (7) <u>Network-powered broadband communications cable metal members not used for</u> <u>communications or powering</u>
- (8) <u>The non-current-carrying metal members of optical fiber cables shall be connected to a grounding electrode in accordance with 770.106(A)(1)</u>. <u>The network terminal, if required to be grounded, shall be connected to a grounding electrode in accordance with 800.106(A)(1)(1)</u>. <u>The grounding electrode shall be bonded in accordance with 770.106(B)</u>.</u>

## (2) Mobile Home Feeder Disconnecting Means.

Where there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, grounding shall comply with one of the following:

- (1) <u>The following components (if present) shall be connected to a grounding electrode in accordance with 800.100(B)(3):</u>
  - (2) Primary protector grounding terminal
  - (3) Network interface unit
  - (4) <u>Network-powered broadband communications shield</u>
  - (5) <u>Network-powered broadband communications cable metal members not used for</u> <u>communications or powering</u>
- (6) <u>The non-current-carrying metal members of optical fiber cables shall be connected to a grounding electrode in accordance with 770.106(A)(2)</u>. <u>The network terminal, if required to be grounded, shall be connected to a grounding electrode in accordance with 800.106(A)(2)</u>. <u>The grounding electrode shall be bonded in accordance with 770.106(B)</u>.</u>

## (B) Bonding.

<u>The primary protector grounding terminal or grounding electrode, network-powered</u> <u>broadband communications cable grounding terminal, or network interface unit grounding</u> <u>terminal shall be bonded together and connected to the metal frame or available grounding</u> <u>terminal of the mobile home with a copper conductor not smaller than 12 AWG under either</u> <u>of the following conditions:</u>

- (1) <u>If there is no mobile home service equipment or disconnecting means as in</u> <u>800.106(A)</u>
- (2) <u>If the mobile home is supplied by cord and plug</u>

Part IV. Installation Methods Within Buildings

800.110 Raceways, Cable Routing Assemblies, and Cable Trays.

### (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.

## <u>(A)</u>

Types of Raceways.

Wires and cables shall be permitted to be installed in raceways that comply with 800.110(A) (1) - 800.110(A)(2) - or 800.110(A)(3) - Medium-power network-powered broadband communications cables shall not be installed in raceways that comply with 800.110(A)(2) -

(1) Raceways Recognized in Chapter 3.

Wires and cables shall be permitted to be installed in any raceway included in Chapter 3. The raceways shall be installed in accordance with Chapter 3.

(2) Communications Raceways.

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, Coaxial Cables, or 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 innerduct in any type of listed raceway permitted in Chapter 3 -

(B) Raceway Fill.

The raceway fill requirements of Chapters 3 and 9 shall apply to medium-power networkpowered broadband communications cables.

(C) Cable Routing Assemblies.

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.

**800.113** Installation of Cables Used for Communications Circuits, Communications Wires, Cable Routing Assemblies, and Communications

ln

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.

Wires and 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.

#### **Raceways**

.Installation of wires

9.

cables, cable routing assemblies, and communications raceways shall comply with 800.113(A) through (L). Installation of cable routing assemblies and communications raceways shall comply also with 800.110. Types of cables used by this section are identified in Table 800.113.

Table 800.113 Cables Used for Communications Circuits

- <del>Listed</del>

# <u>Cable</u>

Types Plenum cables CMP, CATVP, BLP, OFNP, OFCP Riser cables CMR, CATVR, BMR, BLR, OFNR, OFCR General-purpose cables CMG, CM, CATV, BM, BL, OFNG, OFN, OFCG, OFC Limited-use cables CMX, CATVX, BLX Undercarpet CMUC Underground BMU, BLU

### (A) Listing.

Cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways installed in buildings shall be listed and installed in accordance with the limitations of the listing.

Exception: Cables installed in compliance with 800.48 -shall not be required to be listed.

(B) - Ducts Specifically Fabricated for Environmental Air.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in ducts specifically fabricated for environmental air shall be in accordance with 800.113(B)(1) and (B)(2).

#### (1) Uses Permitted.

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) Plenum cables up to 1.22 m (4 ft) in length
- (2) Plenum, rise, general-purpose, and limited-use cables installed in raceways that are installed in compliance with 300.22(B)

#### (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in ducts specifically fabricated for environmental air as described in 300.22(B):

- (1) Plenum, riser, and general-purpose communications raceways
- (2) Plenum, riser, and general-purpose cable routing assemblies
- (3) Riser, general-purpose, and limited-use cables
- (4) Type CMUC cables and wires
- (5) Types BMU and BLU cables
- (6) Communications wires
- (7) Hybrid power and communications cables

Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information on fire protection of wiring installed in fabricated ducts.

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

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in other spaces used for environmental air (plenums) shall be in accordance with 800.113(C)(1) and (C)(2).

### (1) Uses Permitted.

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

- (1) Plenum cables
- (2) Plenum communications raceways
- (3) Plenum cable routing assemblies
- (4) Plenum cables installed in plenum communications raceways
- (5) Plenum cables installed in plenum cable routing assemblies
- (6) Plenum cables and plenum communications raceways supported by open metal cable tray systems
- (7) Plenum, riser, general-purpose, and limited-use cables, and communications wires installed in raceways that are installed in compliance with 300.22(C)
- (8) Plenum, rise, general-purpose, limited-use cables and plenum, riser, and generalpurpose 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) Plenum, riser, general-purpose, and limited-use cables installed in plenum, riser, 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)

## (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in other spaces used for environmental air as described in 300.22(C):

- (1) Riser, general-purpose, and limited-use cables
- (2) Riser and general-purpose communications raceways
- (3) Riser and general-purpose cable routing assemblies
- (4) Type CMUC cables and wires
- (5) Types BMR, BM, BMU, and BLU cables
- (6) Communications wires
- (7) Hybrid power and communications cables

Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers — Cables, Cable Routing Assemblies, and Communications Raceways in Vertical Runs.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in risers shall be in accordance with 800.113(D) (1) and (D)(2).

#### (1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

- (1) Plenum and riser cables
- (2) Plenum and riser communications raceways
- (3) Plenum and riser cable routing assemblies
- (4) Plenum and riser cables installed in the following:
  - (5) Plenum communications raceways
  - (6) Riser communications raceways
  - (7) Plenum cable routing assemblies
  - (8) Riser cable routing assemblies
- (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in risers:

- (1) General-purpose and limited-use cables
- (2) General-purpose communications raceways
- (3) General-purpose cable routing assemblies
- (4) Type CMUC cables and wires
- (5) Types BMR, BM, BMU, and BLU cables
- (6) Communications wires
- (7) Hybrid power and communications cables

Informational Note: See 800.26 for firestop requirements for floor penetrations.

(E) Risers - Cables and Innerducts in Metal Raceways.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in metal raceways in a riser having firestops at each floor shall be in accordance with 800.113(E)(1) and (E)(2).

(1) Uses Permitted.

The following cables and innerducts shall be permitted in metal raceways in a riser having firestops at each floor:

- (1) Plenum, riser, general-purpose, and limited-use cables
- (2) Plenum, riser, and general-purpose communications raceways (innerduct)
- (3) Plenum, riser, general-purpose, and limited-use cables installed in the following:
  - (4) Plenum communications raceways (innerduct)
  - (5) Riser communications raceways (innerduct)
  - (6) General-purpose communications raceways (innerduct)

	National Fire Protection Association Report					
<del>(2)</del>	- <del>Uses Not Permitted.</del>					
The	The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in metal raceways in a riser having firestops at each floor:					
(1)	) Plenum, riser, and general-purpose cable routing assemblies					
(2)	Type CMUC cables and wires					
(3)	Types BMR, BM, BMU, and BLU cables					
(4)	Communications wires					
(5)	) Hybrid power and communications cables					
	Informational Note: See 800.26 for firestop requirements for floor penetrations.					
(F) Fire	<ul> <li>Risers — Cables, Cable Routing Assemblies, and Communications Raceways in eproof Shafts.</li> </ul>					
<del>Insi</del> ass floc	Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in fireproof riser shafts having firestops at each floor shall be in accordance with 800.113(F)(1) and (F)(2).					
<del>(1)</del>	- <del>Uses Permitted.</del>					
<del>The</del> <del>peri</del>	following cables, cable routing assemblies, and communications raceways shall be mitted to be installed in fireproof riser shafts having firestops at each floor:					
(1)	Plenum, riser, general-purpose, and limited-use cables					
(2)	Plenum, riser, and general-purpose communications raceways					
(3)	Plenum, riser, and general-purpose cable routing assemblies					
(4)	Plenum, riser, general-purpose, and limited-use cables installed in the following:					
	(5) Plenum communications raceways					
	(6) Riser communications raceways					
	(7) General-purpose communications raceways					
	(8) Plenum cable routing assemblies					
	(9) Riser cable routing assemblies					
	(10) <del>General-purpose cable routing assemblies</del>					
<del>(2)</del>	- <del>Uses Not Permitted.</del>					
<del>The</del> <del>be p</del>	following cables, wires, cable routing assemblies, and communications raceways shall not permitted in metal raceways in fireproof riser shafts having firestops at each floor:					
(1)	) <del>Type CMUC cables and wires</del>					
(2)	Type BMU and BLU cables					
(3)	Communications wires					
(4)	) Hybrid power and communications cables					

Informational Note: See 800.26 for firestop requirements for floor penetrations.

(G) Risers — One- and Two-Family Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in risers in one- and two-family dwellings shafts shall be in accordance with 800.113(G)(1) and (G)(2).

### (1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted in one- and two-family dwellings:

- (1) Plenum, riser, and general-purpose cables
- (2) Limited-use 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) Plenum, riser, and general-purpose cables installed in the following:
  - (6) Plenum communications raceways
  - (7) Riser communications raceways
  - (8) General-purpose communications raceways
  - (9) Plenum cable routing assemblies
  - (10) Riser cable routing assemblies
  - (11) General-purpose cable routing assemblies

### (2) Uses Not Permitted.

The following cables and wires shall not be permitted in risers in one- and two-family dwellings:

- (1) Type CMUC cables and wires
- (2) Type BMU and BLU cables
- (3) Communications wires
- (4) Hybrid power and communications cables
- (H) Cable

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Trays
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.Installations of cables used for communications circuits

communications wires, cable routing assemblies, and communications raceways supported by cable trays shall be in accordance with 800.113(H)(1) and (H)(2).

(4)	<b>`</b>		Dormittod
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The following wires, cables, and communications raceways shall be permitted to be supported by cable trays:

- (1) Plenum, riser, and general-purpose cables
- (2) Plenum, riser, and general-purpose communications raceways
- (3) Communications wires, plenum, riser, and general-purpose cables installed in the following:
  - (4) Plenum communications raceways
  - (5) Riser communications raceways
  - (6) General-purpose communications raceways
- (2) Uses Not Permitted.

The following cables and wires shall not be supported by cable trays:

- (1) Limited-use cables
- (2) Type CMUC cables and wires
- (3) Type BMU and BLU cables
- (4) Communications wires
- (5) Hybrid power and communications cables

#### (I) - Distributing Frames and Cross-Connect Arrays.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in distributing frames and cross-connect arrays shall be in accordance with 800.113(I)(1) and (I)(2).

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in distributing frames and cross-connect arrays:

- (1) Plenum, riser, and general-purpose cables and communications wires
- (2) Plenum, riser, and general-purpose communications raceways
- (3) Plenum, riser, and general-purpose cable routing assemblies
- (4) Communications wires, plenum, riser, and general-purpose cables installed in the following:
  - (5) Plenum communications raceways
  - (6) Riser communications raceways
  - (7) General-purpose communications raceways
  - (8) Plenum cable routing assemblies
  - (9) Riser cable routing assemblies
  - (10) General-purpose cable routing assemblies

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The following cables and wires shall not be installed in distributing frames and cross-connect arrays:

- (1) Types BMR, BM, BMU, and BLU cables
- (2) Limited-use cables
- (3) Type CMUC cables and wires
- (4) Hybrid power and communications cables

(J) Other Building Locations.

Installations of cables used for communications circuits, cable communications wires, routing assemblies, and communications raceways in building locations other than those covered in 800.113(B) through (I) shall be in accordance with 800.113(J)(1) and (J)(2).

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in building locations other than the locations covered in 800.113(B) through (I):

- (1) Plenum, riser, and general-purpose cables
- (2) Limited-use cables with a maximum of 3 m (10 ft) of exposed length in nonconcealed spaces
- (3) Plenum, riser, and general-purpose communications raceways
- (4) Plenum, riser, and general-purpose cable routing assemblies
- (5) Communications wires, plenum, riser, and general-purpose cables installed in the following:
  - (6) Plenum communications raceways
  - (7) Riser communications raceways
  - (8) General-purpose communications raceways
- (9) Plenum, riser, and general-purpose cables installed in the following:
  - (10) Plenum cable routing assemblies
  - (11) Riser cable routing assemblies
  - (12) General-purpose cable routing assemblies
- (13) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3
- (14) Type CMUC undercarpet communications wires and cables installed under carpet, modular flooring, and planks

### (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be installed in building locations other than the locations covered in 800.113(B) through (I):

- (1) Types BMU and BLU cables
- (2) Communications wires
- (3) Hybrid power and communications cables
- (K) Multifamily Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in multifamily dwellings shall be in accordance with 800.113(K)(1) and (K)(2).

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted to be installed in multifamily dwellings in locations other than the locations covered in 800.113(B) through (G):

- (1) Plenum, riser, and general-purpose cables
- (2) Limited-use 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 plenum, riser, and general-purpose cables installed in the following:
  - (6) Plenum communications raceways
  - (7) Riser communications raceways
  - (8) General-purpose communications raceways
- (9) Plenum, riser, and general-purpose cables installed in the following:
  - (10) Plenum cable routing assemblies
  - (11) Riser cable routing assemblies
  - (12) General-purpose cable routing assemblies
- (13) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3
- (14) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks

### (2) Uses Not Permitted.

The following cables, cable routing assemblies, and communications raceways shall not be installed in multifamily dwellings in locations other than the locations covered in 800.113(B) through (G):

- (1) Types BMU and BLU cables
- (2) Communications wires
- (3) Hybrid power and communications cables

#### (L) One- and Two-Family Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in one- and two-family dwellings in locations other than those covered in 800.113(B) through (F) shall be in accordance with 800.113(L)(1) and (L)(2).

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in one- and two-family dwellings in locations other than the locations covered in 800.113(B) through (F):

- (1) Plenum, riser, and general-purpose cables
- (2) Limited-use 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, plenum, riser, and general-purpose cables installed in the following:
  - (6) Plenum communications raceways
  - (7) Riser communications raceways
  - (8) General-purpose communications raceways
- (9) Plenum, riser, and general-purpose cables installed in the following:
  - (10) Plenum cable routing assemblies
  - (11) Riser cable routing assemblies
  - (12) General-purpose cable routing assemblies
- (13) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3
- (14) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks
- (15) Hybrid power and communications cable listed in accordance with 800.179

### (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be installed in one- and two-family dwellings in locations other than those covered in 800.113(B) through (F):

- (1) Types BMU and BLU cables
- (2) Communications wires

800.133 Installation of Communications Wires and Cables and CATV-Type Coaxial Cables.

Installation of communications wires and cables, from the protector to the equipment, or where no protector is required, communications wires and cables attached to the outside or inside of the building, shall comply with 800.133(A) and 800.133(B). Installation of CATV-type coaxial cables, beyond the point of grounding as defined in 820.93, shall comply with 800.133(A) through (C).

(A) In Raceways, Cable Trays,

# Boxes, Cables, Enclosures, and Cable Routing Assemblies.

# (1) Other Circuits.

<u>Communications cables and CATV-type coaxial cables shall be permitted in the same</u> <u>raceway, cable tray, box, enclosure, or cable routing assembly together and with jacketed</u> <u>cables of any of the following:</u>

- (1) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance</u> with <u>645.5(E)(2)</u> or Parts I and II of Article 725
- (2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
- (3) <u>Nonconductive and conductive optical fiber cables in compliance with Parts I and V of</u> <u>Article 770</u>
- (4) Communications circuits in compliance with Parts I and IV of Articles 800 and 805
- (5) <u>Community antenna television and radio distribution systems in compliance with Parts I</u> and V of Articles 800 and 820
- (6) <u>Low-power network-powered broadband communications circuits in compliance with</u> <u>Parts I and V of Articles 800 and 830</u>

## (2) Class 2 and Class 3 Circuits.

<u>Class 1 circuits shall not be run in the same cable with communications circuits. Class 2 and</u> <u>Class 3 circuit conductors shall be permitted in the same listed communications cable with</u> <u>communications circuits.</u>

(3) <u>Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power</u> <u>Network-Powered Broadband Communications Circuits in Raceways, Compartments, and</u> <u>Boxes.</u>

<u>Communications wires and cables and CATV-type coaxial cables shall not be placed in any</u> <u>raceway, compartment, outlet box, junction box, or similar fitting with conductors of electric</u> <u>light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered</u> <u>broadband communications circuits.</u>

<u>Exception No. 1:</u> <u>Communications wires and cables and CATV-type coaxial cables shall be</u> <u>permitted to be placed in any raceway, compartment, outlet box, junction box, or other</u> <u>enclosures with conductors of electric light, power, Class 1, non-power-limited fire alarm, or</u> <u>medium-power network-powered broadband communications circuits where all of the</u> <u>conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-</u> <u>power network-powered broadband communications circuits are separated from all of the</u> <u>communications wires and cables and CATV-type coaxial cables by a permanent barrier or</u> <u>listed divider.</u>

<u>Exception No. 2:</u> <u>Communications wires and cables and CATV-type coaxial cables shall be</u> <u>permitted to be placed in outlet boxes, junction boxes, or similar fittings or compartments</u> <u>with power conductors where such conductors are introduced solely for power supply to the</u> <u>communications and coaxial cable system distribution equipment. The power circuit</u>

conductors shall be routed within the enclosure to maintain a minimum 6 mm (1/4 in.) separation from the communications wires and cables and the CATV- type coaxial cables.

<u>Exception No. 3:</u> <u>Separation of circuits shall not be required in elevator traveling cables</u> <u>constructed in accordance with by 620.36</u>.

## (B) Other Applications.

<u>Communications wires and cables and CATV-type coaxial cables shall be separated at least</u> 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits.

Exception No. 1: Separation shall not be required where either (1) all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power networkpowered broadband communications circuits are in a raceway or in metal-sheathed, metalclad, nonmetallic-sheathed, Type AC or Type UF cables, or (2) all of the communications wires and cables and all of the CATV-type coaxial cables are encased in raceway.

<u>Exception No. 2: Separation shall not be required where the communications wires and cables and CATV-type coaxial cables are permanently separated from the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.</u>

(C) Support of Communications Wires and Cables and CATV-Type Coaxial Cables.

Raceways shall be used for their intended purpose. Communications wires and cables and CATV-type coaxial cables shall not be strapped, taped, or attached by any means to the exterior of any raceway as a means of support.

<u>Exception:</u> <u>Overhead (aerial) spans of communications drop wires, communications</u> <u>cables, and CATV-type coaxial cables shall be permitted to be attached to the exterior of a</u> <u>raceway-type mast intended for the attachment and support of such wires and cables.</u>

# <u>800.</u>

154 Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies.

Permitted and nonpermitted applications of listed communications wires, cables, coaxial cables, network-powered broadband communications system 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 -

Table 800.154(a) Applications of Listed Communications Wires, Cables, and Network-Powered Broadband Communications System Cables in Buildings

Applications Wire and Cable Type Plenum Riser BMR General-Purpose BM Limited-Use Undercarpet BMU, BLU Hybrid Power and Communications Cables Communications Wires In ducts specifically fabricated for environmental air as described in 300.22(B) In fabricated ducts Y N N N N N N N N N N In metal raceway that complies with 300.22(B) Y Y Y Y Y N N N Y In other spaces used for environmental air (plenums) as described in 300.22(C) In other spaces used for environmental air Y N N N N N N N N N In metal raceway that complies with 300.22(C) YYYYYN NNY In plenum communications raceways Y N N N N N N N N N N In plenum cable routing assemblies Y N N N N N N N N N N Supported by open metal cable trays Y N N N N N N N N N Supported by solid bottom metal cable trays with solid metal covers Y Y Y Y Y N N N N In risers In vertical runs Y Y Y N N N N N N N In metal raceways YYYYYNNNN In fireproof shafts YYYYNNNN In plenum communications raceways Y Y N N N N N N N N N N In plenum cable routing assemblies Y Y N N N N N N N N N N In riser communications raceways Y Y N N N N N N N N N N N riser cable routing assemblies Y Y N N N N N N N N N N In one- and two-family dwellings Y Y Y Y Y N N Y N Within buildings in other than air-handling spaces and risers General Y Y Y Y Y N N N N In one- and two-family dwellings Y Y Y Y Y Y Y N N In multifamily dwellings Y Y Y Y Y Y N N N In nonconcealed

spaces Y Y Y Y Y Y N N N Supported by cable trays Y Y Y Y N N N N N N Under carpet, modular flooring, and planks N N N N N N Y N N In distributing frames and cross-connect arrays Y Y N Y N N N N N Y In rigid metal conduit (RMC) and intermediate metal conduit (IMC) Y Y Y Y Y Y Y Y Y In any raceway recognized in Chapter 3 Y Y Y Y Y N N N Y In plenum communications raceways Y Y N Y N N N N Y In plenum cable routing assemblies Y Y N Y N N N N Y In riser communications raceways Y Y N Y N N N N Y In riser cable routing assemblies Y Y N Y N N N N Y In general-purpose communications raceways Y Y N Y N N N N Y In general-purpose cable routing assemblies Y Y N Y N N N N Y In general-purpose cable routing

Note: An "N" in the table indicates that the cable type shall not be installed in the application. A "Y" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 800.113. The Riser column includes all riser cables except BMR, and the General-Purpose column includes all general-purpose cables except BM.

Informational Note No. 1: Part IV of Article 800 covers installation methods within buildings. This table covers the applications of listed communications wires, cables, and raceways in buildings.

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 Y Y N In metal raceway that covers Y Y In risers In vertical runs Y Y N In metal raceways Y Y Y In fireproof shafts 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 In one- and two-family dwellings Y Y In multifamily dwellings Y Y In nonconcealed spaces Y Y Supported by cable trays Y Y Under carpet, modular flooring, and planks N N N In distributing frames and cross-connect arrays Y Y In nany raceway recognized in Chapter 3 Y Y In plenum cable routing assemblies N N N In riser cable routing assemblies N N N In riser cable routing assemblies N N N In special covers Y Y In plenum cable routing frames and cross-connect arrays Y Y In any raceway recognized in Chapter 3 Y Y In plenum cable routing assemblies N N N In riser cable routing assemblies N N N In riser cable routing assemblies N N N In riser cable routing assemblies N N N In general-purpose 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 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(C) N N N In other spaces used for environmental air (plenums) as described in 300.22(C) N N N In plenum communications raceways N N N Supported by open metal cable trays 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 In plenum communications raceways N N N In fireproof shafts Y Y In plenum communications raceways N N N In fireproof shafts Y Y In plenum communications raceways N N N In riser communications raceways N N In one- and two-family dwellings Y Y Within buildings in other than air-handling spaces and risers General Y Y In one- and two-family dwellings Y Y I n multifamily dwellings Y Y Y In onconcealed spaces Y Y Supported by cable trays Y Y Under carpet, modular flooring, and planks N N N In distributing frames and cross-connect arrays Y Y In any raceway recognized in Chapter 3 N N N In general-purpose communications raceways N N N In riser communications raceways N N N In general-purpose communications raceways N N N In riser communications raceways N N N In general-purpose Note: An "N" in the table indicates that the cable routing assembly type shall not 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.

Part V. Listing Requirements

800.170 Plenum Cable Ties.

Cable ties intended for use in other space used for environmental air (plenums) shall be listed as having low smoke and heat release properties.

Informational Note: See NFPA 90A-2018, Standard for the Installation of Air-Conditioning and Ventilating Systems, and ANSI/UL 2043-2013, Standard for Safety Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces, for information on listing discrete products as having low smoke and heat release properties. <del>800.</del>

## 171 Communications Equipment.

<u>Communications equipment shall be listed as being suitable for electrical connection to a communications network.</u>

Informational Note No. 1: See ANSI/UL 60950-1-2014, Standard for Safety of Information Technology Equipment, ANSI/UL 1863-2012, Standard for Safety Communications Circuit Accessories, or ANSI/UL 62368-1-2014 or ANSI/UL 62368-1-2018, Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements.

Informational Note No. 2: See ANSI/ATIS 0600337-2016, <u>Requirements for Maximum</u> <u>Voltage, Current, and Power Levels Used in Communications Circuits</u>, for additional information regarding voltages, currents, and power allowed on communications circuits.

800.179 Wires and Cables.

<u>Communications wires and cables, community antenna television cables, and network-powered broadband communications cables shall be listed in accordance with 800.179(A) through (L) and 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). Conductors in communications cables, other than in a coaxial cable, shall be copper. Cables shall be permitted to contain optical fibers. Cables containing optical fibers shall be marked with the suffix "-OF."</u>

<u>Communications wires and cables and network-powered communications cables shall have</u> <u>a voltage rating of not less than 300 volts; the insulation for the individual conductors, other</u> 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 under-carpet communications wire.

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

Informational Note No. 1: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.

Informational Note No. 2: See UL 444-2017, Standard for Communications Cables, for information on communications cables.

Informational Note No. 3: See UL1655-2009, Standard for Community-Antenna Television Cables, for information on community-antenna television cables.

## (A) Plenum Cables.

<u>Type CMP communications plenum cables, Type CATVP community antenna television</u> <u>plenum coaxial cables, and Type BLP network-powered broadband communication low-</u> <u>power plenum cables shall be listed as being suitable for use in ducts, plenums, and other</u> <u>spaces used for environmental air and shall also be listed as having adequate fire-resistant</u> <u>and low-smoke-producing characteristics.</u>

Informational Note: See NFPA 262-2019, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, for one method of defining a cable that is low-smoke-producing cable and fire-resistant cable so 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).

# (B) Riser Cables.

<u>Type CMR communications riser cables, Type CATVR community antenna television riser</u> <u>coaxial cables, Type BMR network-powered broadband communications medium-power riser</u> <u>cables, and Type BLR network-powered broadband communications low-power riser cables</u> <u>shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and</u> <u>shall also be listed as having fire-resistant characteristics capable of preventing the carrying</u> <u>of fire from floor to floor.</u>

Informational Note: See ANSI/UL 1666-2017, <u>Standard Test for Flame Propagation</u> <u>Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts</u>, for one method of defining fire-resistant characteristics of the cable capable of preventing the carrying of fire from floor to floor.

(C) General-Purpose Cables.

(1) <u>Type CMG.</u>

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

Informational Note: See CSA Vertical Flame Test — Cables in Cable Trays as described in CSA C22.2 No. 0.3-09 (R2019), Test Methods for Electrical Wires and Cables, for one method of defining resistance to the spread of fire where the damage (char length) of the cable does not exceed 1.5 m (4 ft 11 in.) or FT4 Flame Test in ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables. The smoke measurements in the test methods are not applicable.

(2) Types CM, CATV, BM, and BL.

<u>Type CM communications general-purpose cables, Type CATV community antenna</u> <u>television coaxial general-purpose cables, Type BM network-powered broadband</u> <u>communications medium-power general-purpose cables, and Type BL network-powered</u> <u>broadband communications low-power general-purpose cables shall be listed as being</u> <u>suitable for general-purpose use, with the exception of risers and plenums, and shall also be</u> <u>listed as being resistant to the spread of fire.</u>

Informational Note: See UL Flame Exposure in ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistance to the spread of fire where the damage (char length) of the cable does not to exceed 244 cm (8 ft 0 in.). The smoke measurements in the test method are not applicable.

(D) Limited-Use Cables.

<u>Type CMX limited-use communications cables, Type CATVX limited-use community antenna</u> <u>television coaxial cables, and Type BLX limited-use network-powered broadband low-power</u> <u>cables shall be listed as being suitable for use in dwellings and for use in raceway and shall</u> <u>also be listed as being resistant to flame spread.</u>

Informational Note: See ANSI/UL 2556, Standard for Wire and Cable Test Method, for one method of determining that cable is resistant to flame spread is by testing the cable to the FV-2/VW-1 flame test.

(E) <u>Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.</u>

Cables that are used for survivability of critical circuits under fire conditions shall be listed and meet either 800.179(E)(1), (E)(2), or (E)(3).

## (1) CI Cables.

<u>Cables specified in 800.179(A) through (C) and used for survivability of critical circuits shall</u> be marked with the additional classification using the suffix "Cl." In order to maintain its listed fire rating, Cl cable shall only be installed in free air in accordance with 800.24. Cl cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 800.179(E)(2).

Informational Note: See UL 2196, Standard for Fire Test for Circuit Integrity of Fire-Resistant Power, Instrumentation, Control, and Data Cables, for one method of defining CI cable by establishing a minimum 2-hour fire resistance rating for the cable as specified in UL 444, Standard for Safety Communications Cables.

(2) Fire-Resistive Cable Systems.

<u>Cables specified in 800.179(A) through (C) and 800.179(E)(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.</u>

Informational Note No. 1: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for one method of defining an electrical circuit protective system rating for the system. UL *Guide Information for Electrical Circuit Integrity Systems (FHIT)* contains information to identify the system and its installation limitations to maintain a minimum fire-resistive rating.

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

(3) Electrical Circuit Protective System.

Protectants for cables specified in 800.179(A) through (E), which are part of an electrical circuit protective system, shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the system.

Informational Note: See UL 1724, Fire Tests for Electrical Circuit Protective Systems, for one method of defining an electrical circuit protective system. UL Guide Information for Electrical Circuit Integrity Systems (FHIT) contains information to identify the system and its installation limitations to maintain the fire-resistive rating.

(F) Types CMP-LP, CMR-LP, CMG-LP, and CM-LP Limited Power (LP) Cables.

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

Informational Note: An example of the marking on a communications cable with an LP rating is "CMP-LP (0.6A)(75°C) 23 AWG 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 amperes.

(G) Type CMUC Undercarpet Wires and Cables.

<u>Type CMUC undercarpet communications wires and cables shall be listed as being suitable</u> for undercarpet use and shall also be listed as being resistant to flame spread.

Informational Note: See ANSI/UL 2556, Standard for Wire and Cable Test Methods, for one method of determining that cable is resistant to flame spread in accordance with the FV-2/VW-1 flame test.

## (H) Communications Wires.

<u>Communications wires, such as distributing frame wire and jumper wire, shall be listed as being resistant to the spread of fire.</u>

Informational Note No. 1: See UL Flame Exposure, Vertical Flame Tray Test in ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining cable flame resistance to the spread of fire where the cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

Informational Note No. 2: See CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-09 (R2019), Test Methods for Electrical Wires and Cables, for another method of defining resistance to the spread of fire is for the damage (char length) of the cable to not exceed 1.5 m (4 ft 11 in.).

# (I) Optional Markings.

<u>Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.</u>

Informational Note: <u>These markings can include, but are not limited to, markings for</u> <u>limited-smoke, halogen-free, low-smoke halogen-free, and sunlight resistance.</u>

800.180 Grounding Devices.

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

800.182 Cable Routing Assemblies and Communications Raceways.

Cable routing assemblies and communications raceways shall be listed in accordance with 800.182(A) through (C). Cable routing assemblies shall be marked in accordance with Table 800.182(a) . Communications raceways shall be marked in accordance with Table 800.182(b) .

Informational Note: See ANSI/UL 2024-5-2015, Cable Routing Assemblies and Communications Raceways, for information on listing requirements for both communications raceways and cable routing assemblies.

Table 800.182(a) Cable Routing Assembly Markings

Type Marking Plenum Cable Routing Assembly Plenum Cable Routing Assembly Riser Cable Routing Assembly Riser Cable Routing Assembly General-Purpose Cable Routing Assembly General-Purpose Cable Routing Assembly

Table 800.182(b) Communications Raceway Markings

Type Marking Plenum Communications Raceway Plenum Communications Raceway Riser Communications Raceway Riser Communications Raceway General-Purpose Communications Raceway General-Purpose Communications Raceway (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: See ASTM E84-19B, Standard Test Method for Surface Burning Characteristics of Building Materials, or ANSI/UL 723-2018, Standard Test Method for Surface Burning Characteristics of Building Materials, for one method of defining cable routing assemblies and communications raceways that have adequate fire-resistant and low-smoke-producing characteristics and exhibit a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Informational Note No. 2: See NFPA 262-2019, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, for another method of defining communications raceways that have adequate fire-resistant and low-smoke-producing characteristics and 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.

Informational Note No. 3: See 4.3.11.2.6 or 4.3.11.5.5 of NFPA 90A-2021, 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.

(B) Riser Cable Routing Assemblies and Riser Communications Raceways.

Riser cable routing assemblies and riser communications raceways shall be listed as having adequate fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See ANSI/UL 1666-2017, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts, for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor of the cable routing assemblies and communications raceways.

(C) General-Purpose Cable Routing Assemblies and General-Purpose 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: See ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistance to the spread of fire where the cable routing assemblies and communications raceways do not spread fire to the top of the tray. Article 805 Communications Circuits

Part I. General

805.1 Scope.

This article covers communications circuits and equipment.

805.18 Installation of Equipment.

Equipment electrically connected to a communications network shall be listed in accordance with 800.171.

<u>Exception:</u> This listing requirement shall not apply to test equipment that is intended for temporary connection to a telecommunications network by qualified persons during the course of installation, maintenance, or repair of telecommunications equipment or systems.

### Part Part

II. Wires and Cables Outside and Entering Buildings

**805.47** Underground Communications Wires and Cables Entering Buildings — Underground Block Distribution.

Where the entire street circuit is run underground and the circuit within the block is placed so as to be free from the likelihood of accidental contact with electric light or power circuits of over 300 volts to ground, the insulation requirements of 805.50(A) and 805.50(C) shall not apply, insulating supports shall not be required for the conductors, and bushings shall not be required where the conductors enter the building.

805.50 Circuits Requiring Primary Protectors.

Circuits that require primary protectors as provided in 805.90 shall comply with 805.50(A), 805.50(B), and 805.50(C).

(A) Insulation, Wires, and Cables.

Communications wires and cables without a metal shield, running from the last outdoor support to the primary protector, shall be listed in accordance with 805.173.

### (B) On Buildings.

Communications wires and cables in accordance with 805.50(A) shall be separated at least 100 mm (4 in.) from electric light or power conductors not in a raceway or cable or be permanently separated from conductors of the other systems by a continuous and firmly fixed nonconductor in addition to the insulation on the wires, such as porcelain tubes or flexible tubing. Communications wires and cables in accordance with 805.50(A) exposed to accidental contact with electric light and power conductors operating at over 300 volts to ground and attached to buildings shall be separated from woodwork by being supported on glass, porcelain, or other insulating material.

Exception: Separation from woodwork shall not be required where fuses are omitted as provided for in 805.90(A)(1), or where conductors are used to extend circuits to a building from a cable having a grounded metal sheath.

(C) Entering Buildings.

## (1) Installed Inside Buildings.

If a primary protector is installed inside the building, the communications wires and cables shall enter the building either through a noncombustible, nonabsorbent insulating bushing or through a metal raceway.

Exception: The insulating bushing shall not be required if the entering communications wires and cables meet one or more of the following conditions:

- (1) Is a metal-sheathed cable
- (2) Pass through masonry
- (3) Meet the requirements of 805.50(A) and fuses are omitted in accordance with 805.90(A)(1)
- (4) Meet the requirements of 805.50(A) -and are used to extend circuits to a building from a cable having a grounded metal sheath
- (2) Orientation of Raceways or Bushings.

Raceways or bushings shall slope upward from the outside, or, where this cannot be done, drip loops shall be formed in the communications wires and cables immediately before they enter the building.

(3) Service Head.

Raceways shall be equipped with an approved service head. More than one communications wire and cable shall be permitted to enter through a single raceway or bushing. Conduits or other metal raceways located ahead of the primary protector shall be grounded.

Part

The substitutions for communications cables listed in Table 805.154 and illustrated in Figure 805.154 shall be permitted.

Table 805.154 Cable Substitutions

Cable Type Permitted Substitutions CMR CMP CMG, CM CMP, CMR CMX CMP, CMR, CMG, CM

Figure 805.154 Cable Substitution Hierarchy.

### III. Protection

## 805.90 Protective Devices.

## (A) Application.

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) <u>Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning.</u>
- (2) <u>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 metal conduit containing the cable is connected to each building grounding electrode system.</u>
- (3) <u>Areas having an average of five or fewer thunderstorm days per year and earth</u> resistivity of less than 100 ohm-meters. Such areas are found along the Pacific <u>coast.</u>

Informational Note No. 3: See NFPA 780-2020, Standard for the Installation of Lightning Protection Systems, for information on lightning protection systems.

(1) Fuseless Primary Protectors.

Fuseless-type primary protectors shall be permitted under any of the following conditions:

- (1) Where conductors enter a building through a cable with grounded metallic sheath member(s) and where the conductors in the cable safely fuse on all currents greater than the current-carrying capacity of the primary protector and of the primary protector bonding conductor or grounding electrode conductor
- (2) Where insulated conductors in accordance with <u>805.50(A)</u> are used to extend circuits to a building from a cable with an effectively grounded metallic sheath member(s) and where the conductors in the cable or cable stub, or the connections between the insulated conductors and the plant exposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground, safely fuse on all currents greater than the current-carrying capacity of the primary protector, or the associated insulated conductors and of the primary protector bonding conductor or grounding electrode conductor
- (3) Where insulated conductors in accordance with <u>805.50(A)</u> or (B) are used to extend circuits to a building from other than a cable with metallic sheath member(s), where (a) the primary protector is listed as being suitable for this purpose for application with circuits extending from other than a cable with metallic sheath members and (b) the connections of the insulated conductors to the plant exposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground or the conductors operating at greater than 300 volts to ground or the conductors operating at greater than 300 volts to ground or the conductors operating at greater than 300 volts to ground safely fuse on all currents greater than the current-carrying capacity of the primary protector, or associated insulated conductors and of the primary protector bonding conductor or grounding electrode conductor
- (4) Where insulated conductors in accordance with <u>805.50(A)</u> are used to extend circuits aerially to a building from a buried or underground circuit that is unexposed to accidental contact with electric light or power conductors operating at greater than <u>300 volts to ground</u>
- (5) Where insulated conductors in accordance with 805.50(A) are used to extend circuits to a building from cable with an effectively grounded metallic sheath member(s), and where (a) the combination of the primary protector and insulated conductors is listed as being suitable for this purpose for application with circuits extending from a cable with an effectively grounded metallic sheath member(s) and (b) the insulated conductors safely fuse on all currents greater than the current-carrying capacity of the primary protector and of the primary protector bonding conductor or grounding electrode conductor

Informational Note: See ANSI/IEEE C2-2017, National Electrical Safety Code, Section 9, for examples of methods of protective grounding that can achieve effective grounding of communications cable sheaths for cables from which communications circuits are extended.

(2) Fused Primary Protectors.

Where the requirements listed under 805.90(A)(1) (a) through (A)(1)(e) are not met, fusedtype primary protectors shall be used. Fused-type primary protectors shall consist of an arrester connected between each line conductor and ground, a fuse in series with each line conductor, and an appropriate mounting arrangement. Primary protector terminals shall be marked to indicate line, instrument, and ground, as applicable.

## (B) Location.

The primary protector shall be located in, on, or immediately adjacent to the structure or building served and as close as practicable to the point of entrance.

For purposes of this section, primary protectors located at mobile home service equipment within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means connected to an electrode by a grounding electrode conductor in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: Selecting a primary protector location to achieve the shortest practicable primary protector bonding conductor or grounding electrode conductor helps limit potential differences between communications circuits and other metallic systems.

(C) Hazardous (Classified) Locations.

The primary protector shall not be located in any hazardous (classified) locations, as defined in 500.5 and 505.5, or in the vicinity of easily ignitible material.

Exception: As permitted in 501.150, 502.150, and 503.150.

(D) Secondary Protectors.

Where a secondary protector is installed in series with the indoor communications wire and cable between the primary protector and the equipment, it shall be listed for the purpose in accordance with 805.170(B).

Informational Note: Secondary protectors on circuits exposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground are not intended for use without primary protectors.

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

<u>Communications cables entering the building or terminating on the outside of the building</u> shall comply with 805.93(A) or (B).

(A) Entering Buildings.

In installations where the communications cable enters a building, the metallic sheath members of the cable shall be 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 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.

Part IV. Installation Methods Within Buildings

805.154 - Substitutions for Listed Communications Cables.



# 805.156 Dwelling Unit Communications Outlet.

For new construction, a minimum of one communications outlet shall be installed within the dwelling in a readily accessible area and cabled to the service provider demarcation point.

Part V. Listing Requirements

805.170 Protectors.

Protectors shall be listed in accordance with 805.170(A) or 805.170(B).

(A) Primary Protectors.

<u>The primary protector shall be listed and consist of an arrester connected between each</u> <u>line conductor and ground in an appropriate mounting. Primary protector terminals shall be</u> <u>marked to indicate line and ground as applicable.</u>

Informational Note: See ANSI/UL 497-2017, Standard for Protectors for Paired Conductor Communications Circuits, to determine applicable requirements for a listed primary protector.

(B) Secondary Protectors.

The secondary protector shall be listed as suitable to provide means to safely limit currents to less than the current-carrying capacity of listed indoor communications wire and cable, listed telephone set line cords, and listed communications terminal equipment having ports for external wire line communications circuits. Any overvoltage protection, arresters, or grounding connection shall be connected on the equipment terminals side of the secondary protector current-limiting means.

Informational Note: See ANSI/UL 497A-2019, Standard for Secondary Protectors for Communications Circuits, to determine applicable requirements for a listed secondary protector.

805.173 Drop Wire and Cable.

Communications wires and cables without a metallic shield, running from the last outdoor support to the primary protector, shall be listed as being suitable for the purpose and shall have current-carrying capacity as specified in 805.90(A)(1) (b) or (A)(1)(c).

820.154 Substitutions of Listed CATV Cables.

The substitutions for coaxial cables in Table 820.154 and illustrated in Figure 820.154 shall be permitted.

Informational Note: The substitute cables in Table 820.154 and Figure 820.154 are only coaxial-type cables.

Table 820.154 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 Coaxial Cable Substitution Hierarchy.
Article 810 Antenna Systems.

Part I. General

810.1 Scope.

This article covers antenna systems for radio and television receiving equipment, amateur and citizen band radio transmitting and receiving equipment, and certain features of transmitter safety. This article covers antennas such as wire-strung type, multi-element, vertical rod, flat, or parabolic and also covers the wiring and cabling that connect them to equipment. This article does not cover equipment and antennas used for coupling carrier current to power line conductors.

810.3 Other Articles.

Wiring from the source of power to and between devices connected to the interior wiring system shall comply with the following:

- (1) <u>Chapters 1 through 4</u> other than as modified by Parts I and II of Article 640.
- (2) <u>Coaxial cables that connect antennas to equipment shall comply with the appropriate article of Chapter 8.</u>
- (3) <u>Wiring and equipment installed in hazardous (classified) locations shall comply with</u> the appropriate requirements in Chapter 5.

810.4 Community Television Antenna.

The installation of the antenna shall comply with this article. The installation of the distribution system shall comply with the appropriate article of Chapter 8.

810.5 Radio Noise Suppression.

Radio interference eliminators, interference capacitors, or noise suppressors connected to power-supply leads shall be of a listed type. They shall not be exposed to physical damage.

810.6 Antenna Lead-In Protectors.

If an antenna lead-in surge protector is installed, it shall be listed as being suitable for limiting surges on the cable that connects the antenna to the receiver/transmitter electronics and shall be connected between the conductors and the grounded shield or other ground connection. The antenna lead-in protector shall be grounded using a bonding conductor or grounding electrode conductor installed in accordance with 810.21(F).

Informational Note: See UL 497E, Outline of Investigation for Protectors for Antenna Lead-In Conductors, for information concerning protectors for antenna lead-in conductors.

810.7 Grounding Devices.

If bonding or grounding is required, devices used to connect a shield, a sheath, noncurrent-carrying metal members of a cable, or metal parts of equipment or antennas to a bonding conductor or grounding electrode conductor shall be listed or be part of listed equipment.

Part II. Receiving Equipment — Antenna Systems

810.11 Material.

Antennas and lead-in conductors shall be of hard-drawn copper, bronze, aluminum alloy, copper-clad steel, or other high-strength, corrosion-resistant material.

<u>Exception:</u> <u>Soft-drawn or medium-drawn copper shall be permitted for lead-in</u> <u>conductors if the maximum span between points of support is less than 11 m (35 ft).</u>

#### 810.12 Supports.

Outdoor antennas and lead-in conductors shall be securely supported. The antennas or lead-in conductors shall not be attached to the electric service mast. They shall not be attached to poles or similar structures carrying open electric light or power wires or trolley wires of over 250 volts between conductors. Insulators supporting the antenna conductors shall have sufficient mechanical strength to safely support the conductors. Lead-in conductors shall be securely attached to the antennas.

810.13 Avoidance of Contacts with Conductors of Other Systems.

Outdoor antennas and lead-in conductors from an antenna to a building shall not cross over open conductors of electric light or power circuits and shall be kept well away from all such circuits so as to avoid the possibility of accidental contact. Where proximity to open electric light or power service conductors of less than 250 volts between conductors cannot be avoided, the installation shall be such as to provide a clearance of at least 600 mm (2 ft).

Where practicable, antenna conductors shall be installed so as not to cross under open electric light or power conductors.

#### 810.14 Splices.

<u>Splices and joints in antenna spans shall be made mechanically secure with approved splicing devices or by such other means and be suitable for the conditions of use and location in compliance with 110.14(A) and (B).</u>

810.15 Grounding or Bonding.

<u>Masts and metal structures supporting antennas shall be grounded or bonded in</u> <u>accordance with</u> <u>810.21</u>, <u>unless the antenna and its related supporting mast or structure</u> <u>are within a zone of protection defined by a 46 m (150 ft) radius rolling sphere.</u>

Informational Note: <u>See NFPA 780-2020</u>, <u>Standard for the Installation of Lightning</u> <u>Protection Systems</u>, <u>4.7.3.1</u>, for the application of the term <u>rolling sphere</u>.

810.16 Size of Wire-Strung Antenna — Receiving Station.

(A) Size of Antenna Conductors.

<u>Outdoor antenna conductors for receiving stations shall be of a size not less than given in Table 810.16(A)</u>.

Table 810.16(A) Size of Receiving Station Outdoor Antenna Conductors

	Minimum Size of Conductors (AWG) Where Maximum Open Span Length Is		
		<u>11 m to</u>	
<u>Material</u>	<u>Less Than</u>	45 m (35 ft	Over 45 m (150 ft)
	<u>11 m (35 ft)</u>		<u> </u>
		<u>to 150 ft)</u>	
Aluminum alloy, hard-drawn copper	<u>19</u>	<u>14</u>	<u>12</u>
<u>Copper-clad steel, bronze, or</u> <u>other high-strength material</u>	<u>20</u>	<u>17</u>	<u>14</u>

#### (B) Self-Supporting Antennas.

Outdoor antennas, such as vertical rods and flat, parabolic, or dipole structures, shall be of corrosion-resistant materials and of strength suitable to withstand ice and wind loading conditions and shall be located well away from overhead conductors of electric light and power circuits of over 150 volts to ground, so as to avoid the possibility of the antenna or structure falling into or making accidental contact with such circuits.

#### 810.17 Size of Lead-in — Receiving Station.

Lead-in conductors from outside antennas for receiving stations shall, for various maximum open span lengths, be of such size as to have a tensile strength at least as great as that of the conductors for antennas as specified in <u>810.16</u>. If the lead-in consists of two or more conductors that are twisted together, are enclosed in the same covering, or are concentric, the conductor size shall, for various maximum open span lengths, be such that the tensile strength of the combination is at least as great as that of the conductors for antennas as specified in <u>810.16</u>.

810.18 Clearances — Receiving Stations.

(A) Outside of Buildings.

Lead-in conductors attached to buildings shall be installed so that they cannot swing closer than 600 mm (2 ft) to the conductors of circuits of 250 volts or less between conductors, or 3.0 m (10 ft) to the conductors of circuits of over 250 volts between conductors, except that in the case of circuits not over 150 volts between conductors, if all conductors involved are supported so as to ensure permanent separation, the clearance shall be permitted to be reduced but shall not be less than 100 mm (4 in.). The clearance between lead-in conductors and any conductor forming a part of a lightning protection system shall not be less than 1.8 m (6 ft). Underground conductors shall be separated at least 300 mm (12 in.) from conductors of any light or power circuits or Class 1 circuits.

<u>Exception:</u> The separation and clearance requirements shall not apply if the electric light or power conductors, Class 1 conductors, or lead-in conductors are installed in raceways or metal cable armor.

Informational Note No. 1: See 250.60 for grounding associated with lightning protection components — strike termination devices. See NFPA 780-2020, Standard for the Installation of Lightning Protection Systems, for detailed information on grounding, bonding, and spacing from lightning protection systems, and the calculation of specific separation distances using the sideflash equation in Section 4.6.

Informational Note No. 2: See NFPA 780-2020, Standard for the Installation of Lighting Protection Systems, for information on bonding or separation of metal raceways, enclosures, frames, and other non-current-carrying metal parts of electrical equipment installed on a building equipped with a lightning protection system. Separation from lightning protection conductors is typically 1.8 m (6 ft) through air or 900 mm (3 ft) through dense materials such as concrete, brick, or wood.

(B) Antennas and Lead-ins — Indoors.

Indoor antennas and indoor lead-ins shall not be run nearer than 50 mm (2 in.) to conductors of other wiring systems in the premises unless one of the following conditions applies:

- (1) The other conductors are in metal raceways or cable armor.
- (2) <u>The indoor antennas and indoor lead-ins are permanently separated from such other</u> <u>conductors by a continuous firmly fixed nonconductor.</u>

(C) In Boxes or Other Enclosures.

Indoor antennas and indoor lead-ins shall be permitted to occupy the same box or enclosure with conductors of other wiring systems if separated from such other conductors by an effective permanently installed barrier.

810.19 Electrical Supply Circuits Used in Lieu of Antenna — Receiving Stations.

If an electrical supply circuit is used in lieu of an antenna, the device by which the radio receiving set is connected to the supply circuit shall be listed.

810.20 Antenna Discharge Units — Receiving Stations.

#### (A) General Requirement.

Each lead-in conductor from an outdoor antenna shall be provided with a listed antenna discharge unit.

<u>Exception:</u> <u>A separate antenna discharge unit is not required if the lead-in conductors</u> <u>are enclosed in a continuous metal shield that complies with one of the following:</u>

(1) Is grounded or bonded with a conductor in accordance with 810.21

(2) Is protected by an antenna discharge unit

#### (B) Location.

Antenna discharge units shall be located outside the building or inside the building between the point of entrance of the lead-in and the radio set or transformers and as near as practicable to the entrance of the conductors to the building. The antenna discharge unit shall not be located near combustible material or in a hazardous (classified) location as defined in accordance with 500.5 and 505.5.

(C) Grounding or Bonding.

The antenna discharge unit shall be grounded or bonded in accordance with 810.21.

<u>810.21</u> Bonding Conductors and Grounding Electrode Conductors — Receiving Stations.

Bonding conductors and grounding electrode conductors shall comply with <u>810.21(A)</u> through <u>810.21(K)</u>.

(A) Material.

<u>The bonding conductor or grounding electrode conductor shall be of copper, aluminum, copper-clad steel, copper-clad aluminum, bronze, or similar corrosion-resistant material.</u> <u>Aluminum or copper-clad aluminum bonding conductors or grounding electrode</u> <u>conductors shall not be used if subject to corrosive conditions or in direct contact with</u> <u>masonry or the earth or where subject to corrosive conditions. If used outside, aluminum or copper-clad aluminum conductors shall not be installed within 450 mm (18 in.) of the <u>earth.</u></u>

(B) Insulation.

Insulation on bonding conductors or grounding electrode conductors shall not be required.

(C) Supports.

The bonding conductor or grounding electrode conductor shall be securely fastened in place and shall be permitted to be directly attached to the surface wired over without the use of insulating supports.

<u>Exception:</u> <u>Where proper support cannot be provided, the size of the bonding</u> <u>conductors or grounding electrode conductors shall be increased proportionately.</u>

(D) 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.

(E) Run in Straight Line.

<u>The bonding conductor or grounding electrode conductor for an antenna mast or antenna</u> <u>discharge unit shall be run in as straight a line as practicable.</u>

#### (F) Electrode.

<u>The bonding conductor or grounding electrode conductor shall be connected as required</u> in 810.21(F)(1) through 810.21(F)(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 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 power service accessible means external to the building, as covered in 250.94
- (3) The nonflexible metal power service raceway
- (4) The service equipment enclosure
- (5) <u>The grounding electrode conductor or the grounding electrode conductor metal</u> <u>enclosures of the power service</u>
- (6) <u>The grounded interior metal water piping systems, within 1.52 m (5 ft) from its point</u> of entrance to the building, as covered in 250.52

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.

(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 810.21(F)(2), the grounding electrode conductor shall be connected to a grounding electrode as described in 250.52.

(G) Inside or Outside Building.

The bonding conductor or grounding electrode conductor shall be permitted to be run either inside or outside the building.

<u>(H) Size.</u>

<u>The bonding conductor or grounding electrode conductor shall not be smaller than</u> <u>10 AWG copper, 8 AWG aluminum, or 17 AWG copper-clad steel or bronze.</u>

(I) Common Ground.

<u>A single bonding conductor or grounding electrode conductor shall be permitted for both</u> <u>protective and operating purposes.</u>

(J) Bonding of Electrodes.

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

(K) Electrode Connection.

Connections to grounding electrodes shall comply with 250.70.

Part III. Amateur and Citizen Band Transmitting and Receiving Stations — Antenna Systems

810.51 Other Sections.

In addition to complying with Part III, antenna systems for amateur and citizen band transmitting and receiving stations shall also comply with <u>810.11</u> through <u>810.15</u>.

#### 810.52 Size of Conductors.

Antenna conductors for transmitting and receiving stations shall be of a size not less than given in Table 810.52.

Table 810.52 Size of Outdoor Antenna Conductors

	Minimum Size of Conductors (AWG) If Maximum Open Span Length Is		
<u>Material</u>	<u>Less Than 45 m</u>	<u>Over 45 m</u>	
	<u>(150 ft)</u>	<u>(150 ft)</u>	
Hard-drawn copper	<u>14</u>	<u>10</u>	
<u>Copper-clad steel, bronze, or other</u> <u>high-strength material</u>	<u>14</u>	<u>12</u>	

#### 810.53 Size of Lead-in Conductors.

Lead-in conductors for transmitting stations shall, for various maximum span lengths, be of a size at least as great as that of conductors for antennas as specified in 810.52.

810.54 Clearance on Building.

Antenna conductors for transmitting stations, attached to buildings, shall be firmly mounted at least 75 mm (3 in.) clear of the surface of the building on nonabsorbent insulating supports, such as treated pins or brackets equipped with insulators having not less than 75-mm (3-in.) creepage and airgap distances. Lead-in conductors attached to buildings shall also comply with these requirements.

<u>Exception:</u> If the lead-in conductors are enclosed in a continuous metal shield that is grounded with a conductor in accordance with 810.58, they shall not be required to comply with these requirements. If grounded, the metal shield shall also be permitted to be used as a conductor.

810.55 Entrance to Building.

Except where protected with a continuous metallic shield that is grounded with a conductor in accordance with 810.58, lead-in conductors for transmitting stations shall enter buildings by one of the following methods:

- (1) <u>Through a rigid, noncombustible, nonabsorbent insulating tube or bushing</u>
- (2) <u>Through an opening provided for the purpose in which the entrance conductors are firmly secured so as to provide a clearance of at least 50 mm (2 in.)</u>
- (3) <u>Through a drilled window pane</u>

810.56 Protection Against Accidental Contact.

Lead-in conductors to radio transmitters shall be located or installed so as to make accidental contact with them difficult.

810.57 Antenna Discharge Units — Transmitting Stations.

Each lead-in conductor for outdoor antennas shall be provided with an antenna discharge unit or other suitable means that drain static charges from the antenna system.

<u>Exception No. 1:</u> If the lead-in conductor is protected by a continuous metal shield that is grounded with a conductor in accordance with 810.58, an antenna discharge unit or other suitable means shall not be required for the lead-in conductor.

Exception No. 2: If the antenna is grounded or bonded with a conductor in accordance with 810.58, an antenna discharge unit or other suitable means shall not be required.

<u>810.58</u> Bonding Conductors and Grounding Electrode Conductors — Amateur and Citizen Band Transmitting and Receiving Stations.

Bonding conductors and grounding electrode conductors shall comply with <u>810.58(A)</u> through <u>810.58(C)</u>.

(A) Other Sections.

<u>All bonding conductors and grounding electrode conductors for amateur and citizen band</u> <u>transmitting and receiving stations shall comply with 810.21(A) through 810.21(C).</u>

(B) Size of Protective Bonding Conductor or Grounding Electrode Conductor.

The protective bonding conductor or grounding electrode conductor for transmitting stations shall be as large as the lead-in but not smaller than 10 AWG copper, bronze, or copper-clad steel.

(C) Size of Operating Bonding Conductor or Grounding Electrode Conductor.

The operating bonding conductor or grounding electrode conductor for transmitting stations shall not be less than 14 AWG copper or its equivalent.

Part IV. Interior Installation — Transmitting Stations

810.70 Separation from Other Conductors.

<u>All conductors inside the building shall be separated at least 100 mm (4 in.) from the conductors of any electric light, power, or signaling circuit unless one of the following conditions applies:</u>

- (1) <u>The conductors of a permanent audio system are installed in compliance with Parts</u> <u>I and II of Article 640</u>.
- (2) <u>The conductors of portable and temporary audio systems are installed in</u> <u>compliance with Parts I and III of Article 640</u>.
- (3) <u>The conductors are separated from such other conductors by a continuous and firmly fixed nonconductor.</u>

#### 810.71 General.

Transmitters shall comply with 810.71(A) through (C).

(A) Enclosing.

The transmitter shall be enclosed in a metal frame or grille or separated from the operating space by a barrier or other equivalent means, all metallic parts of which are effectively connected to a bonding conductor or grounding electrode conductor.

(B) Grounding of Controls.

<u>All external metal handles and controls accessible to the operating personnel shall be</u> <u>effectively connected to an equipment grounding conductor if the transmitter is powered</u> <u>by the premises wiring system or grounded with a conductor in accordance with 810.21</u>.

(C) Interlocks on Doors.

<u>All access doors shall be provided with interlocks that disconnect all voltages of over</u> <u>350 volts between conductors when any access door is opened.</u>

Article 820 Community Antenna Television and Radio Distribution Systems

Part I. General

820.1 Scope.

This article covers coaxial cable distribution of radio frequency signals typically employed in community antenna television (CATV) systems.

820.3 Other Articles.

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.

#### 820.15 Power Limitations.

Coaxial cable shall be permitted to deliver power to equipment that is directly associated with the radio frequency distribution system if the voltage is not over 60 volts and if the current is supplied by a transformer or other device that has power-limiting characteristics.

Power shall be blocked from premises devices on the network that are not intended to be powered via the coaxial cable.

Part III. Protection

820.93 Grounding of the Outer Conductive Shield of Coaxial Cables.

Coaxial cables entering buildings or attached to buildings shall comply with 820.93(A) or (B). Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required. For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: Selecting a grounding block location to achieve the shortest practicable bonding conductor or grounding electrode conductor helps limit potential differences between CATV and other metallic systems.

(A) Entering Buildings.

In installations where the coaxial cable enters the building, the outer conductive shield shall be grounded in accordance with 820.100. The grounding shall be as close as practicable to the point of entrance.

(B) Terminating Outside of the Building.

In installations where the coaxial cable is terminated outside of the building, the outer conductive shield shall be grounded in accordance with <u>820.100</u>. The grounding shall be as close as practicable to the point of attachment or termination.

(C) Location.

Where installed, a listed primary protector shall be applied on each community antenna and radio distribution (CATV) cable external to the premises. The listed primary protector shall be located as close as practicable to the entrance point of the cable on either side or integral to the ground block.

(D) Hazardous (Classified) Locations.

If a primary protector or equipment providing the primary protection function is used, it shall not be located in any hazardous (classified) location as defined in 500.5 and 505.5 or in the vicinity of easily ignitible material.

<u>Exception:</u> <u>Primary protection equipment shall be used only if permitted by 501.150,</u> 502.150, and 503.150.

Part IV. Grounding Methods

820.100 Cable Bonding and Grounding.

The shield of the coaxial cable shall be bonded or grounded as specified in <u>820.100(A)</u> and (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: <u>See NFPA 780-2020</u>, <u>Standard for the Installation of</u> <u>Lightning Protection Systems</u>, <u>4.7.3.1</u>, for the application of the term <u>rolling</u> <u>sphere</u>.

(A) General Requirements.

The installation shall be in accordance with 800.100.

(B) Shield Protection Devices.

<u>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.</u>

820.103 Equipment Grounding.

<u>Unpowered equipment and enclosures or equipment powered by the coaxial cable shall</u> <u>be considered grounded where connected to the metallic cable shield.</u>

Part V. Installation Methods Within Buildings



Article 830 Network-Powered Broadband Communications Systems

Part I. General

830.1 Scope.

This article covers network-powered broadband communications systems that provide any combination of voice, audio, video, data, and interactive services through a network interface unit.

Informational Note: A typical basic system configuration includes a cable supplying power and broadband signal to a network interface unit that converts the broadband signal to the component signals. Typical cables are coaxial cable with both broadband signal and power on the center conductor, composite metallic cable with a coaxial member(s) or twisted pair members for the broadband signal and twisted pair members for power, and hybrid optical fiber cable with a pair of conductors for power. Larger systems may also include network components such as amplifiers that require network power.

830.15	Power Limitations.	
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Network-powered broadband communications systems shall be classified as having lowor medium-power sources as specified in the following:

- (1) Sources shall be classified as defined in Table 830.15.
- (2) <u>Direct-current power sources exceeding 150 volts to ground, but no more than 200 volts to ground, with the current to ground limited to 10 mA dc, that meet the current and power limitation for medium-power sources in Table 830.15 shall be classified as medium-power sources.</u>

Informational Note: <u>See UL 60950-21-2007</u>, <u>Standard for Safety for Information</u> <u>Technology Equipment</u> — <u>Safety</u> — <u>Part 21</u>: <u>Remote Power Feeding</u>, for listing information on equipment that complies with 830.15(2).</u>

Table 830.15 Limitations for Network-Powered Broadband Communications Systems

Network Power Source	Low	Medium
<u>Circuit voltage, V max (volts)</u> <sup>1</sup>	<u>0–100</u>	<u>0–150</u>
Power limitation, VA max		
	<u>250</u>	<u>250</u>
(volt-amperes) <sup>1</sup>		
<u>Current limitation, I max (amperes)</u>	<u>1000/ V <sub>max</sub></u>	<u>1000/ V <sub>max</sub></u>
Maximum power rating		
	<u>100</u>	<u>100</u>
<u>(volt-amperes)</u>		
<u>Maximum voltage rating (volts)</u>	<u>100</u>	<u>150</u>
<u>Maximum overcurrent protection (amperes)</u> <sup>2</sup>	<u>100/ V <sub>max</sub></u>	NA

 $\frac{1}{V}$  max , <u>I</u> max , and <u>VA</u> max are determined with the current-limiting impedance in the circuit (not bypassed) as follows:

V max — Maximum system voltage regardless of load with rated input applied

<u>*I* max</u> — Maximum system current under any noncapacitive load, including short circuit, and with overcurrent protection bypassed if used. <u>*I* max</u> limits apply after 1 minute of operation

<u>VA</u> <u>max</u> — Maximum volt-ampere output after 1 minute of operation regardless of load and overcurrent protection bypassed if used

<sup>2</sup> <u>Overcurrent protection is not required if the current-limiting device provides equivalent</u> <u>current limitation and the current-limiting device does not reset until power or the load is</u> <u>removed.</u>

Part

II. Cables Outside and Entering Buildings

830.40 Entrance Cables.

Network-powered broadband communications cables located outside and entering buildings shall comply with 830.40(A) and (B).

#### (A) Medium-Power Circuits.

Medium-power network-powered broadband communications circuits located outside and entering buildings shall be installed using Type BMU, Type BM, or Type BMR networkpowered broadband communications medium-power cables.

#### (B) - Low-Power Circuits.

Low-power network-powered broadband communications circuits located outside and entering buildings shall be installed using Type BLU or Type BLX low-power networkpowered broadband communications cables. Cables shown in Table 830.154 -shall be permitted to substitute.

830.44 Overhead (Aerial) Cables.

Overhead (aerial) network-powered broadband communications cables shall comply with 830.44(A) through (F).

(A) On Poles and In-Span or Above Roofs.

Where network-powered broadband communications cables are installed on poles and inspan or above roofs, they shall comply with 800.44.

(B) 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<sup>‡</sup>/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<sup>†</sup>/2 ft) over residential property and driveways, and those commercial areas not subject to truck traffic
- (3) 4.7 m (15<sup>4</sup>/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: See ANSI/IEEE C2-2017, 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.

(C) 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.

#### (D) 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.

#### (E) 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.

#### (F) 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(F)(1) through (F)(3).

(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) 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.

830.47 Underground Network-Powered Broadband Communications Cables Entering Buildings.

Underground network-powered broadband communications cables entering buildings shall comply with 830.47(A) and (B).

(A) Protection from Physical Damage.

Direct-buried cable, conduit, or other raceways shall be installed to meet the minimum cover requirements of Table 830.47(A). 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(A) 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(A) below grade to the point of entrance.

Exception: Protection from physical damage shall not be required if a low-power networkpowered broadband communications circuit is equipped with a listed fault protection device that is located on the network side of the network-powered broadband cable being protected and the device is appropriate to the network-powered broadband communications cable used. Table 830.47(A) Network-Powered Broadband Communications Systems Minimum Cover Requirements

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. Cover is the shortest distance measured between a point on the top surface of any directburied cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.

2. Raceways approved for burial only where concrete encased shall require a concrete envelope not less than 50 mm (2 in.) thick.

3. Lesser depths shall be permitted where cables rise for terminations or splices or where access is otherwise required.

4. 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.

(B) Pools.

Cables located under the pool or within the area extending 1.5 m (5 ft) horizontally from the inside wall of the pool shall meet those clearances and requirements specified in 680.11.

Part

III. Protection

830.90 Primary Electrical Protection.

(A) Application.

Primary electrical protection shall be provided on all network-powered broadband communications conductors that are neither grounded nor interrupted and are run partly or entirely in aerial cable not confined within a block. Also, primary electrical protection shall be provided on all aerial or underground network-powered broadband communications conductors that are neither grounded nor interrupted and are located within the block containing the building served so as to be exposed to lightning or accidental contact with electric light or power conductors operating at over 300 volts to ground.

<u>Exception:</u> <u>Primary electrical protection shall not be required on the network-powered</u> <u>broadband communications conductors where electrical protection is provided on the</u> <u>derived circuit(s) (output side of the NIU) in accordance with</u> <u>830.90(B)(3)</u>.

Informational Note No. 1: On network-powered broadband communications conductors not exposed to lightning or accidental contact with power conductors, providing primary electrical protection in accordance with this article helps protect against other hazards, such as ground potential rise caused by power fault currents, and above-normal voltages induced by fault currents on power circuits in proximity to the network-powered broadband communications conductors.

Informational Note No. 2: Network-powered broadband communications circuits are considered to have a lightning exposure unless one or more of the following conditions exist:

- (1) <u>Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning.</u>
- (2) <u>Areas having an average of five or fewer thunderstorm days each year and earth resistivity of less than 100 ohm-meters. Such areas are found along the Pacific coast.</u>

Informational Note No. 3: See NFPA 780-2020, Standard for the Installation of Lightning Protection Systems, for information on lightning protection systems.

(1) Fuseless Primary Protectors.

<u>Fuseless-type primary protectors shall be permitted where power fault currents on all protected conductors in the cable are safely limited to a value no greater than the current-carrying capacity of the primary protector and of the primary protector bonding conductor or grounding electrode conductor.</u>

(2) Fused Primary Protectors.

Where the requirements listed in <u>830.90(A)(1)</u> are not met, fused-type primary protectors shall be used. Fused-type primary protectors shall consist of an arrester connected between each conductor to be protected and ground, a fuse in series with each conductor to be protected, and an appropriate mounting arrangement. Fused primary protector terminals shall be marked to indicate line, instrument, and ground, as applicable.

### (B) Location.

The location of the primary protector, where required, shall comply with the following:

- (1) <u>A listed primary protector shall be applied on each network-powered broadband</u> <u>communications cable external to and on the network side of the network interface</u> <u>unit.</u>
- (2) <u>The primary protector function shall be an integral part of and contained in the network interface unit. The network interface unit shall be listed as being suitable for application with network-powered broadband communications systems and shall have an external marking indicating that it contains primary electrical protection.</u>
- (3) <u>The primary protector(s) shall be provided on the derived circuit(s) (output side of the NIU), and the combination of the NIU and the protector(s) shall be listed as being suitable for application with network-powered broadband communications systems.</u>

<u>A primary protector, whether provided integrally or external to the network interface unit, shall be located as close as practicable to the point of entrance.</u>

For purposes of this section, a network interface unit and any externally provided primary protectors located at mobile home service equipment located in sight from and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located in sight from and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: Selecting a network interface unit and primary protector location to achieve the shortest practicable primary protector bonding conductor or grounding electrode conductor helps limit potential differences between communications circuits and other metallic systems.

(C) Hazardous (Classified) Locations.

The primary protector or equipment providing the primary protection function shall not be located in any hazardous (classified) location as defined in 500.5 and 505.5 or in the vicinity of easily ignitible material.

Exception: As permitted in 501.150, 502.150, and 503.150.

Part IV. Grounding Methods

**830.93** Grounding or Interruption of Metallic Members of Network-Powered Broadband Communications Cables.

<u>Network-powered communications cables entering buildings or attaching to buildings</u> <u>shall comply with 830.93(A) or (B).</u>

For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: Selecting a grounding location to achieve the shortest practicable bonding conductor or grounding electrode conductor helps limit potential differences between the network-powered broadband communications circuits and other metallic systems.

(A) Entering Buildings.

In installations where the network-powered communications cable enters the building, the shield shall be grounded in accordance with 800.100, and metallic members of the cable not used for communications or powering shall be grounded in accordance with 800.100 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 Outside of the Building.

In installations where the network-powered communications cable is terminated outside of the building, the shield shall be grounded in accordance with <u>800.100</u>, and metallic members of the cable not used for communications or powering shall be grounded in accordance with <u>800.100</u> or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment of the NIU.

Part V. Installation Methods Within Buildings

**830.133** Installation of Network-Powered Broadband Communications Cables and Equipment.

<u>Cable and equipment installations within buildings shall comply with 830.133(A)</u> through (C), as applicable.

(A) Separation of Conductors.

(1) In Raceways, Cable Trays, Boxes, Enclosures, and Cable Routing Assemblies.

(a) Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables. Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(b) Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits. Low-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits:

- (3) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in</u> <u>compliance with Parts I and II of Article</u> 725
- (4) <u>Power-limited fire alarm systems in compliance with Parts I and III of Article</u> 760
- (5) Communications circuits in compliance with Parts I and IV of Article 805
- (6) <u>Nonconductive and conductive optical fiber cables in compliance with Parts I and V</u> of Article <u>770</u>
- (7) <u>Community antenna television and radio distribution systems in compliance with</u> <u>Parts I and V of Article</u> 820

(h) <u>Medium-Power Network-Powered Broadband Communications Circuit Cables</u> <u>with Optical Fiber Cables and Other Communications Cables</u>. Medium-power networkpowered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

- (9) Communications circuits in compliance with Parts I and IV of Article 805
- (10) Conductive optical fiber cables in compliance with Parts I and V of Article 770
- (11) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(I) <u>Medium-Power Network-Powered Broadband Communications Circuit Cables</u> <u>with Other Circuits</u>. <u>Medium-power network-powered broadband communications cables</u> <u>shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing</u> <u>assembly with conductors of any of the following circuits:</u>

(13) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in</u> <u>compliance with Parts I and II of Article</u> 725

(14) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(o) <u>Electric Light, Power, Class 1, Nonpowered Broadband Communications Circuit</u> <u>Cables.</u> Network-powered broadband communications cable shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables.

<u>Exception No. 1:</u> Network-powered broadband communications cable shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

<u>Exception No. 2:</u> <u>Where power circuit conductors in outlet boxes, junction boxes,</u> <u>or similar fittings or compartments where such conductors are introduced solely for</u> <u>power supply to the network-powered broadband communications system distribution</u> <u>equipment, the power circuit conductors shall be routed within the enclosure to</u>

maintain a minimum 6 mm (<u>1/4</u> in.) separation from network-powered broadband communications cables.

#### (2) Other Applications.

<u>Network-powered broadband communications cable shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, and non-power-limited fire alarm circuits.</u>

Exception No. 1: Separation shall not be required where: (1) all of the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC, or Type UF cables, or (2) all of the network-powered broadband communications cables are encased in a raceway.

Exception No. 2: Separation shall not be required where the network-powered broadband communications cables are permanently separated from the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(B) Support of Network-Powered Broadband Communications Cables.

<u>Raceways shall be used for their intended purpose. Network-powered broadband</u> <u>communications cables shall not be strapped, taped, or attached by any means to the</u> <u>exterior of any conduit or raceway as a means of support.</u>

(C) Splicing of Medium-Powered Network-Powered Communications Cables.

Where a medium-powered network-powered broadband communications cable is spliced or extended, a listed junction box or listed patch panel shall be used.

<u>830.</u>

154 Substitutions of Network-Powered Broadband Communications System Cables.

The substitutions for network-powered broadband system cables listed in Table 830.154 shall be permitted.

#### Table 830.154 Cable Substitutions

Cable Type Permitted Cable Substitutions BM BMR BLP CMP, CL3P BLR CMP, CL3P, CMR, CL3R, BLP, BMR BL CMP, CMR, CM, CMG, CL3P, CL3R, CL3, BMR, BM, BLP, BLR BLR BLX CMP, CMR, CM, CMG, CMX, CL3P, CL3R, CL3, CL3X, BMR, BM, BLP, BRP, BL 830.

#### 160 Bends.

Bends in network broadband cable shall be made so as not to damage the cable. The radius of the curve of the inner edge of any bend shall not be less than 10 times the diameter of the cable.

Informational Note: See ANSI/TIA-568.0-E- Generic Telecommunications Cabling for Customer Premises, for information on bend radii of network broadband cable during different types of installation conditions.

#### Part VI. Listing Requirements

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) through (C).

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 -

#### (A) General Requirements.

The general requirements in 800.179 shall apply.

(B) Network-Powered Broadband Communications Medium-Power Cables.

Network-powered broadband communications medium-power cables shall be factoryassembled 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 310.8. Type BMU cables shall be jacketed and listed as being suitable for outdoor underground use.

(C) 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 310.8. Type BLU cables shall be jacketed and listed as being suitable for outdoor underground use.

#### Article 840 Premises-Powered Broadband Communications Systems

#### Part I. General

## 840.1 Scope.

This article covers premises-powered broadband communications systems.

Informational Note: A typical basic system configuration consists of an optical fiber, twisted pair, or coaxial cable to the premises supplying a broadband signal to a network terminal that converts the broadband signal into component signals, such as traditional telephone, video, high-speed Internet, and interactive services. Powering for the network terminal and network devices is typically accomplished through a premises power supply that might be built into the network terminal or provided as a separate unit. In order to provide communications in the event of a power interruption, a battery backup unit or an uninterruptible power supply (UPS) is typically part of the powering system.

#### Part Part

II. Cables Outside and Entering Buildings

840.47 Underground Wires and Cables Entering Buildings.

Direct-buried cables shall be installed to have a minimum cover of 150 mm (6 in.).

Part

III. Protection

840.90 Protective Devices.

The requirements of 805.90 shall apply.

840.93 Grounding or Interruption.

<u>Non-current-carrying metallic members of optical fiber cables, communications</u> <u>cables, or coaxial cables entering buildings or attaching to buildings shall comply with</u> <u>840.93(A), (B), or (C), respectively.</u>

(A) Non-Current-Carrying Metallic Members of Optical Fiber Cables.

Non-current-carrying metallic members of optical fiber cables entering a building or terminating on the outside of a building shall comply with 770.93(A) or (B).

(B) Communications Cables.

The grounding or interruption of the metallic sheath of communications cable shall comply with 805.93.

(C) Coaxial Cables.

Where the network terminal is installed inside or outside of the building, with coaxial cables terminating at the network terminal, and is either entering, exiting, or attached to the outside of the building, 820.93 shall apply.

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, 805.90 and 805.93 shall apply.

Informational Note: <u>See NFPA 780-2020</u>, <u>Standard for the Installation of</u> <u>Lightning Protection Systems</u>, for the theory of the term <u>rolling sphere</u>.

Part IV. Grounding Methods

840.101 Premises Circuits Not Leaving the Building.

If the network terminal is served by a nonconductive optical fiber cable, or where any non-current-carrying metal member of a conductive optical fiber cable is interrupted by an insulating joint or equivalent device, and circuits that terminate at the network terminal are completely contained within the building (i.e., they do not exit the building), 840.101(A), (B), or (C) shall apply, as applicable.

(A) Coaxial Cable Shield Grounding.

The shield of coaxial cable shall be grounded by one of the following:

- (1) Any of the methods described in 820.100 or 800.106
- (2) <u>A fixed connection to an equipment grounding conductor as described in 250.118</u>
- (3) <u>Connection to the network terminal grounding terminal provided that the terminal</u> is connected to ground by one of the methods described in <u>820.100</u> or <u>800.106</u>, or to an equipment grounding conductor through a listed grounding device that will retain the ground connection if the network terminal is unplugged

(B) Communications Circuit Grounding.

Communications circuits shall not be required to be grounded.

#### (C) Network Terminal Grounding.

The network terminal shall not be required to be grounded unless required by its listing. If the coaxial cable shield is separately grounded as described in <u>840.101(A)</u> (<u>1</u>) or <u>840.101(A)(2</u>), the use of a cord and plug for the connection to the network terminal grounding connection shall be permitted.

Informational Note: If required to be grounded, a listed device that extends the equipment grounding conductor from the receptacle to the network terminal equipment grounding terminal is permitted. Sizing of the extended equipment grounding conductor is covered in Table 250.122.

840.102 Premises Circuits Leaving the Building.

If 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, the installation of communications wires and cables shall comply with 800.100 and 800.106, and the installation of coaxial cables shall comply with 820.100 and 800.106.

Informational Note: <u>See NFPA 780-2020</u>, <u>Standard for the Installation of</u> <u>Lightning Protection Systems</u>, for the application of the term <u>rolling sphere</u>.

#### Part

VI. Premises Powering of Communications Equipment over Communications Cables

#### 840.160 Powering Circuits.

Listed communications cables, in addition to carrying the communications circuit, shall also be permitted to carry circuits for powering listed communications equipment. The power source shall be listed in accordance with 840.170(C). Installation of the listed 4-pair communications cables for a communications circuit or installation where 4-pair communications cables are substituted for Class 2 and Class 3 cables in accordance with 722.135(E) -shall comply with 725.144.

Exception: Installing communications cables in compliance with 725.144 shall not be required for listed 4-pair communications cables where the rated current of the power source does not exceed 0.3 amperes in any conductor 24 AWG or larger.

Informational Note No. 1: A typical communications cable for this application is a 4pair 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.

Informational Note No. 2: See 725.144 for requirements to manage the temperature rise of bundles of cables that provide power.

VI	<u>Listing Requirements</u>
<u>84(</u>	D.170 Equipment and Cables.
Pre cor	mises-powered broadband communications systems equipment and cables shall nply with 840.170(A) through (D).
<u>(A</u> )	Network Terminal.
The with	e network terminal and applicable grounding means shall be listed for application premises-powered broadband communications systems.
	Informational Note No. 1: See ANSI/UL 60950-1-2014, Standard for Safety of Information Technology Equipment; ANSI/UL 498A-2015, Current Taps and Adapters; ANSI/UL 467-2013, Grounding and Bonding Equipment; or ANSI/UL 62368-1-2014, Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements.
	Informational Note No. 2: <u>There are no requirements on the network terminal</u> and its grounding methodologies except for those covered by the listing of the product.
(	
<del>B)</del>	Premises Communications Wires and Cables.
<del>Cor</del> 800	nmunications wires and cables shall be listed and marked in accordance with <del>.179</del> .
(	
<del>C)</del>	- Power Source.
The cab Cha eith	power source for circuits intended to provide power over communications les to remote equipment shall be limited in accordance with Table 11(B) in apter 9 for voltage sources up to 60 volts dc and be listed as specified in er of the following:
(1)	A power source shall be listed as specified in 725.60(A)(1), (A)(2), (A) (3), or (A)(4). The power sources shall not have the output connections paralleled or otherwise interconnected unless listed for such interconnection.
(2)	A power source shall be listed as communications equipment for limited- power circuits.
	Informational Note: See ANSI/UL 60950-1-2014, Standard for Safety of Information Technology Equipment-Safety — Part 1, or ANSI/UL 62368-1-2014, Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements. Typically, such circuits are used to interconnect equipment for the purpose of exchanging information (data).
<del>(D)</del>	- Accessory Equipment.
<del>Cor</del> app	nmunications accessory equipment and/or assemblies shall be listed for lication with premises-powered communications systems.
	Informational Note: See ANSI/UL 1863-2004, Communications-Circuit

# File Name Limited\_Energy\_TG\_Substantiation.docx

Description Substantiation <u>Approved</u>

# Statement of Problem and Substantiation for Public Input

This PI is submitted as part of the work of the 722 Limited Energy Task group. It deletes text that was relocated by the TG. See the attachment for the substantiation from the overall TG.

## **Related Public Inputs for This Document**

Related Input	<u>Relationship</u>
Public Input No. 3673-NFPA 70-2023 [Article 722]	same TG effort
Public Input No. 3674-NFPA 70-2023 [Article 724]	same TG effort
Public Input No. 3684-NFPA 70-2023 [Article 725]	same TG effort
Public Input No. 3686-NFPA 70-2023 [Article 726]	same TG effort
Public Input No. 3687-NFPA 70-2023 [Article 760]	same TG effort
Public Input No. 3690-NFPA 70-2023 [Article 770]	same TG effort

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Committee:	NEC-P16	

## **Committee Statement**

**Resolution:** This public input does not provide technical substantiation and reasons for the changes to ensure the structure of the code.

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



This article covers general requirements for communications systems. These general requirements apply to communications circuits, community antenna television and radio distribution systems, network-powered broadband communications systems, and premises powered broadband communications systems, unless modified by Articles 805, 820, 830, 840. Informational Note No. 1: See 90.2(D)(4) for installations of circuits and equipment t are not covered. Informational Note No. 2: See Part II of Article 725, Part II for information on the installation of Class 2 and Class 3 <u>power-limited</u> circuits and 722.135(E) for the substitution of communications cables for Class 2 and Class 3 cables. Informational Note No. 3: See Part II of Article 760, Part II for information on the installation of power-limited fire alarm circuits, including the substitution of communications cables for Class 2 and States. Informational Note No. 4: See C2-2023, National Electrical Safety Code, 1 information on outside plant cabling. Thermation Onutice No. 4: See C2-2023, National Electrical Safety Code, 1 information on outside plant cabling. The substitution of convertion of communications systems, and Article 770, Optical Fiber Cables, coordinate ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 8, Communications Systems, and Article 770, Optical Fiber Cables, coordinate ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70, Cover in-building installations of communications systems. Communications silize both metallic conductor cables and optical fiber cables. formational Notes 2 & 3 were edited to comply with the NEC Style manual. nitter Information Verification ubmitter Full Name: Leslie Jutte rganization: Plastics Industry Association (PLASTICS) reet Address: ity: iate: p: jubmittal Date: Fri Aug 18 10:24:54 EDT 2023 ommittee: NEC-P16 mittee Statement esolution: FR-7549-NEPA 70-2024 tatement: Including data communications in Article 800 improves the usabil	800.1 S	cope.
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Informational Note No. 4: See C2-2023, National Electrical Safety Code, : information on outside plant cabling.  ment of Problem and Substantiation for Public Input EC Chapter 8, Communications Systems, and Article 770, Optical Fiber Cables, coordinate ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Cha ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Cha ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Cha ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Cha ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Cha ational Electrical Safety Code. The NESC covers outside plant installations, while NEC Cha illize both metallic conductor cables and optical fiber cables. formational Notes 2 & 3 were edited to comply with the NEC Style manual. nitter Information Verification ubmitter Full Name: Leslie Jutte rganization: Plastics Industry Association ffiliation: Plastics Industry Association (PLASTICS) treet Address: ity: tate: p: ubmittal Date: Fri Aug 18 10:24:54 EDT 2023 ommittee: NEC-P16 mittee Statement esolution: <u>FR-7549-NFPA 70-2024</u> tatement: Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	Info insi cor	ormational Note No. 3: See <del>Part II of</del> Article 760 <u>, Part II</u> for information on the tallation of power-limited fire alarm circuits, including the substitution of nmunications cables for power-limited fire alarm cables.
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ubmitter Full Name: Leslie Jutte         rganization:       Plastics Industry Association         ffiliation:       Plastics Industry Association (PLASTICS)         treet Address:       ity:         ity:       tate:         p:       ubmittal Date:       Fri Aug 18 10:24:54 EDT 2023         ommittee:       NEC-P16         mittee Statement       esolution: <u>FR-7549-NFPA 70-2024</u> tatement:       Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 tilize both n	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications systems netallic conductor cables and optical fiber cables.
rganization:       Plastics Industry Association         ffiliation:       Plastics Industry Association (PLASTICS)         treet Address:       ity:         ity:       itate:         p:       ubmittal Date:         wittee:       Fri Aug 18 10:24:54 EDT 2023         ommittee:       NEC-P16         mittee Statement         esolution: <u>FR-7549-NFPA 70-2024</u> tatement:       Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 iilize both r iformationa <b>nitter Inf</b>	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications system netallic conductor cables and optical fiber cables.
filiation:       Plastics Industry Association (PLASTICS)         treet Address:       ity:         tate:       p:         ubmittal Date:       Fri Aug 18 10:24:54 EDT 2023         ommittee:       NEC-P16         mittee Statement         esolution: <u>FR-7549-NFPA 70-2024</u> tatement:       Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 tilize both n formationa <b>nitter Inf</b>	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications systematic conductor cables and optical fiber cables. In Notes 2 & 3 were edited to comply with the NEC Style manual.
treet Address: ity: tate: p: ubmittal Date: Fri Aug 18 10:24:54 EDT 2023 ommittee: NEC-P16 mittee Statement esolution: <u>FR-7549-NFPA 70-2024</u> tatement: Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 tilize both n formationa <b>nitter Inf</b> ubmitter F rganizatio	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications systematic conductor cables and optical fiber cables. Il Notes 2 & 3 were edited to comply with the NEC Style manual. <b>ormation Verification</b> <b>ull Name:</b> Leslie Jutte <b>n:</b> Plastics Industry Association
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tate: p: ubmittal Date: Fri Aug 18 10:24:54 EDT 2023 ommittee: NEC-P16 mittee Statement esolution: <u>FR-7549-NFPA 70-2024</u> tatement: Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 iilize both r formationa <b>nitter Inf</b> ubmitter F rganizatio ffiliation: treet Addro	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications system netallic conductor cables and optical fiber cables. IN Notes 2 & 3 were edited to comply with the NEC Style manual. <b>ormation Verification</b> <b>ull Name:</b> Leslie Jutte <b>n:</b> Plastics Industry Association Plastics Industry Association (PLASTICS) <b>ess:</b>
p: ubmittal Date: Fri Aug 18 10:24:54 EDT 2023 ommittee: NEC-P16 mittee Statement esolution: <u>FR-7549-NFPA 70-2024</u> tatement: Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 tilize both n formationa <b>nitter Inf</b> ubmitter F rganizatio ffiliation: treet Addre	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications system netallic conductor cables and optical fiber cables. IN Notes 2 & 3 were edited to comply with the NEC Style manual. <b>ormation Verification</b> <b>ull Name:</b> Leslie Jutte <b>n:</b> Plastics Industry Association Plastics Industry Association (PLASTICS) <b>ess:</b>
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mittee Statement esolution: <u>FR-7549-NFPA 70-2024</u> tatement: Including data communications in Article 800 improves the usability of the Code most Code users assume it's already in Article 800	ational Ele nd Article 7 ilize both n formationa <b>nitter Inf</b> ubmitter F rganizatio ffiliation: treet Addre ity: tate: p: ubmittal D	ate:       Fri Aug 18 10:24:54 EDT 2023
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In order to comply with 4.1.4 of the NEO Style Manual references to the individ	ational Ele nd Article 7 ilize both r formationa <b>nitter Inf</b> Jbmitter F rganizatio filiation: reet Addro ty: ate: p: Jbmittal D pommittee: mittee Si esolution: tatement:	ctrical Safety Code. The NESC covers outside plant installations, while NEC Chapter 70 cover in-building installations of communications systems. Communications systemetallic conductor cables and optical fiber cables.         Il Notes 2 & 3 were edited to comply with the NEC Style manual.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Fri Aug 18 10:24:54 EDT 2023         NEC-P16         tatement         FR-7549-NFPA 70-2024         Including data communications in Article 800 improves the usability of the Code si most Code users assume it's already in Article 800

Articles in Chapter 8 were replaced with a general reference to other Articles in the Chapter. Additional compliance with 4.1.4 required stating the Article number before the Part number in the Article.

Adding a reference to Class 4 systems improves usability since these systems are often used to power communications systems.

Adding a reference to the NESC improves usability since the NESC covers outside plant installations and coordinated with Article 800.

An informational note was added to identify specialty definitions in Article 100 that are important to communications and thereby improve usability.

Public Input	No. 2964-NFPA 70-2023 [ Section No. 800.1 ]
800.1 Scope.	
This article cover requirements and distribution syst powered broad 840.	ers general requirements for communications systems. These general oply to communications circuits, community antenna television and radio tems, network-powered broadband communications systems, and premises- band communications systems, unless modified by Articles 805, 820, 830, or
Information are not co	onal Note No. 1: See 90.2(D)(4) for installations of circuits and equipment that overed.
Informatio installatio communio	onal Note No. 2: See <del>Part II of</del> Article <u>725</u> -f <del>or</del> <u>, Part II for</u> information on the n of Class 2 and Class 3 circuits and 722.135(E) for the substitution of cations cables for Class 2 and Class 3 cables.
Informatio installatio communio	onal Note No. 3: See <del>Part II of</del> Article <u>760</u> - <del>for</del> <u>, Part II for</u> information on the n of power-limited fire alarm circuits, including the substitution of cations cables for power-limited fire alarm cables.
number shall prece The Usability Task Chad Kennedy and	de the part number. Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, David Williams.
Submitter Full Na	me: David Williams
Organization: Street Address: City: State: Zip:	Delta Charter Township
Submittal Date:	Mon Aug 28 13:21:52 EDT 2023
Committee:	NEC-P16
mmittee Statem	ient
Resolution: FR-7	549-NFPA 70-2024
Statement: Inclue	ding data communications in Article 800 improves the usability of the Code since

In order to comply with 4.1.4 of the NEC Style Manual, references to the individual Articles in Chapter 8 were replaced with a general reference to other Articles in the

Chapter. Additional compliance with 4.1.4 required stating the Article number before the Part number in the Article.

Adding a reference to Class 4 systems improves usability since these systems are often used to power communications systems.

Adding a reference to the NESC improves usability since the NESC covers outside plant installations and coordinated with Article 800.

An informational note was added to identify specialty definitions in Article 100 that are important to communications and thereby improve usability.

Public Ir	put No. 3613-NFPA 70-2023 [ Section No. 800.1 ]			
800.1 Sc	ope.			
This articl requireme distributio powered <del>840</del> <u>other</u>	e covers general requirements for communications systems. These general ents apply to communications circuits, community antenna television and radio n systems, network-powered broadband communications systems, and premises- proadband communications systems, unless modified by <del>Articles 805, -820, -830, or</del> <u>articles in this Chapter</u> .			
Info are	rmational Note No. 1: See 90.2(D)(4) for installations of circuits and equipment that not covered.			
Info Cla cab	rmational Note No. 2: See Part II of Article 725 for information on the installation of as 2 and Class 3 circuits and 722.135(E) for the substitution of communications les for Class 2 and Class 3 cables.			
Info pow pow	rmational Note No. 3: See Part II of Article 760 for information on the installation of rer-limited fire alarm circuits, including the substitution of communications cables for rer-limited fire alarm cables.			
Statement of	Problem and Substantiation for Public Input			
Section 4.1.4 where require articles in this without chan	of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or ed for context. In this scope statement, a simple change to acknowledge that other s chapter may modify these general requirements should comply with the Style Manual ging the intent of the statement.			
Submitter F	II Name: Dishard Halub			
Organization Street Addre	n: The DuPont Company, Inc. ss:			
State:				
Submittal Da Committee:	te: Tue Sep 05 08:04:06 EDT 2023 NEC-P16			
Committee St	Committee Statement			
Resolution: Statement:	<u>FR-7549-NFPA 70-2024</u> Including data communications in Article 800 improves the usability of the Code since most Code users assume it's already in Article 800.			
	In order to comply with 4.1.4 of the NEC Style Manual, references to the individual Articles in Chapter 8 were replaced with a general reference to other Articles in the Chapter. Additional compliance with 4.1.4 required stating the Article number before the Part number in the Article.			
	Adding a reference to Class 4 systems improves usability since these systems are often used to power communications systems.			

Adding a reference to the NESC improves usability since the NESC covers outside plant installations and coordinated with Article 800.

An informational note was added to identify specialty definitions in Article 100 that are important to communications and thereby improve usability.
# Public Input No. 3683-NFPA 70-2023 [ Section No. 800.1 ] 800.1 Scope. This article covers general requirements for communications systems. These general requirements apply to communications circuits, community antenna television and radio distribution systems, network-powered broadband communications systems, and premisespowered broadband communications systems, unless modified by Articles 805, 820, 830, or 840. Informational Note No. 1: See 90.2(D)(4) for installations of circuits and equipment that are not covered. Informational Note No. 2: See Part II of Article 725 for information on the installation of Class 2 and Class 3 circuits and 722.135(E) for the substitution of communications cables for Class 2 and Class 3 cables. Informational Note No. 3: See Part II of Article 760 for information on the installation of power-limited fire alarm circuits, including the substitution of communications cables for power-limited fire alarm cables. 800.1+ Community Broadband Reliability. For the purpose of mitigating fire and other hazards to a community adopting this Code the reliability of the telecommunication network shall be determined by and assessed for conformance by the Authority Having Jurisdiction. Statement of Problem and Substantiation for Public Input This proposal is intended to open best practice discovery and promulgation onto another, perhaps a more important, front - community resilience to all hazards when internet access has failed. Communities - larger than single buildings or campuses - whose fire hazards are relatively well managed with titles in the NFPA catalog - are at greater risk when communication facilities have vanished. In other words, disaster and/or outage resilience is far more impeded with the loss of internet access than with the loss of power alone. Installation of backup generators among property owners continues to gather pace, but property owners have less control over the reliability of internet access when the power to telecommunication infrastructure is scattered across central offices, remote terminal cabinets power supply units and similarly capable technologies. People can live without power but commerce comes to a virtual standstill day and night without internet access. Since rollout of iPhone apps in 2007 nothing in community life has been the same. Friends of the National Electrical Code are important and capable stakeholders in advancing community broadband reliability and should not depend solely upon action by state and federal regulators. We do not have to start from scratch. ATIS has a committee that provides information in the document linked below: Search: "ATIS Network Reliability Steering Committee 2021-2022 Operational Report"

https://access.atis.org/apps/group\_public/download.php/70750/ATIS-0100071,%20Network%20Reliability%20Steering%20Committee%202021-2022%20Operational%20Report.pdf

## **Submitter Information Verification**

	Submitter Full Name	: Michael Anthony
	Organization:	Standards Michigan LLC
	Affiliation:	StandardsMichigan.COM
	Street Address:	
	City:	
	State:	
	Zip:	
	Submittal Date:	Tue Sep 05 13:53:37 EDT 2023
	Committee:	NEC-P16
Cor	nmittee Statemer	it
	<b>Resolution:</b> Assessin of parts and ther	ng the reliability of the telephone network would require assessing the reliability of the network that are under the exclusive control of communications utilities efore not covered by the NEC. See 90.2(D)(4).

Public li	put No. 4068-NF	PA 70-2023 [ Section No. 800.1 ]	
800 1 5	ope		
This artic requirement television systems, Articles 8	e covers general requents apply to communant apply to communand radio distribution and premises-powere 05, 820, 830, or 840.	uirements for communications systems. Thes nications circuits, <u>data communications,</u> comm n systems, network-powered broadband comr ed broadband communications systems, unles	e general unity antenna nunications ss modified by
Info	mational Note No. 1: not covered.	: See 90.2(D)(4) for installations of circuits an	d equipment that
Infc Cla con	mational Note No. 2: s 2 and Class 3 <u>pov</u> munications cables f	: See Part II of Article 725 for information on t <u>wer-limited</u> _circuits and 722.135(E) for the su for Class 2 and Class 3 cables.	he installation of bstitution of
Infc pov pov	mational Note No. 3: er-limited fire alarm c er-limited fire alarm c	: See Part II of Article 760 for information on t circuits, including the substitution of communic cables.	he installation of cations cables for
Statement of	Problem and Sub	bstantiation for Public Input	
<ul> <li>Moving since most C</li> <li>Refines</li> </ul>	data communications ode users assume it's the note to just powe	s into Article 800 (from Article 725) improves u s already in Article 800 er-limited circuits.	isability of the Code
Related Publi	Inputs for This	Document	
<u>Public Input</u> Center, Mod	No. 4064-NFPA 70-2 Ilar (MDC)]	Related Input 2023 [New Definition after Definition: Data	<u>Relationship</u> Related
Submitter Inf	rmation Verifica	ation	
Submitter F	II Name: Jeff Silveira	a	
Organizatio	: Bicsi	-	
Street Addre	ss:		
City:			
State:			
Zip:	to: Wed Sep 0	06 45-24-42 EDT 2022	
Committee:	NEC-P16	JU 13.31.42 EDT 2023	
Committee St	atement		
Resolution:			
	FR-7549-NFPA 70-2	2024	
Statement:	<u>FR-7549-NFPA 70-2</u> Including data comm most Code users ass	2 <u>024</u> nunications in Article 800 improves the usabili <sup>.</sup> sume it's already in Article 800.	ty of the Code since

Articles in Chapter 8 were replaced with a general reference to other Articles in the Chapter. Additional compliance with 4.1.4 required stating the Article number before the Part number in the Article.

Adding a reference to Class 4 systems improves usability since these systems are often used to power communications systems.

Adding a reference to the NESC improves usability since the NESC covers outside plant installations and coordinated with Article 800.

Public In	put No. 41/4-NFPA /0-2023 [ Section No. 800.1 ]
800.1 Sc	ope.
This article requireme distribution powered to 840.	e covers general requirements for communications systems. These general nts apply to communications circuits, community antenna television and radio n systems, network-powered broadband communications systems, and premises- proadband communications systems, unless modified by Articles 805, 820, 830, or
Info are	mational Note No. 1: See 90.2(D)(4) for installations of circuits and equipment than not covered.
Info Clas cabl	mational Note No. 2: See Part II of Article 725 for information on the installation of s 2 and Class 3 circuits and 722.135(E) for the substitution of communications es for Class 2 and Class 3 cables.
Info <u>Clas</u>	mational Note No. 3: See Part II of Article <u>726 for information on the installation of s 4 circuits.</u>
<u>Info</u> pow pow	<u>mational Note No. 4: See Part II of Article</u> 760 for information on the installation c er-limited fire alarm circuits, including the substitution of communications cables fo er-limited fire alarm cables.
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800.1 Scope.		
This article cover requirements ap television and ra systems, and pr Articles 805, 820	ers general requirements for communications systeply to communications circuits, <u>data communica</u> adio distribution systems, network-powered broad emises-powered broadband communications systems, 830, or 840.	stems. These general <u>tions,</u> community antenna dband communications stems, unless modified by
Informatio are not co	nal Note No. 1: See 90.2(D)(4) for installations o vered.	f circuits and equipment that
Informatio Class 2 ar communic	nal Note No. 2: See Part II of Article 725 for infor nd Class 3 <u>power-limited</u> circuits and 722.135(E) ations cables for Class 2 and Class 3 cables.	mation on the installation of ) for the substitution of
Informatio power-limi power-limi	nal Note No. 3: See Part II of Article 760 for infor ited fire alarm circuits, including the substitution o ited fire alarm cables.	mation on the installation of of communications cables for
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Articles in Chapter 8 were replaced with a general reference to other Articles in the Chapter. Additional compliance with 4.1.4 required stating the Article number before the Part number in the Article.

Adding a reference to Class 4 systems improves usability since these systems are often used to power communications systems.

Adding a reference to the NESC improves usability since the NESC covers outside plant installations and coordinated with Article 800.

800.1 Scope.		
This article cov requirements a distribution syst powered broad 840.	ers general requirements for communications oply to communications circuits, community a ems, network-powered broadband communic band communications systems, unless modifi	systems. These general ntenna television and radio ations systems, and premises- ed by Articles 805, 820, 830, or
Information are not co	onal Note No. 1: See 90.2(D)(4) for installation overed.	ns of circuits and equipment that
Informatio installatio communi	onal Note No. 2: See <del>Part II of</del> Article 725 <u>, Pa</u> n of Class 2 and Class 3 circuits and 722.135 cations cables for Class 2 and Class 3 cables	<u>rt II_</u> for information on the (E) for the substitution of
Informatio installatio communi	onal Note No. 3: See <del>Part II of</del> Article 760 <u>, Pa</u> n of power-limited fire alarm circuits, including cations cables for power-limited fire alarm cab	<u>rt II</u> for information on the the substitution of les.
<u>Informatio</u> communi	onal Note No. 4: See Article 726, Part II for inf cations circuits and the installation of Class 4	ormation on powering of circuits.
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#### Resolution: FR-7549-NFPA 70-2024

**Statement:** Including data communications in Article 800 improves the usability of the Code since most Code users assume it's already in Article 800.

In order to comply with 4.1.4 of the NEC Style Manual, references to the individual Articles in Chapter 8 were replaced with a general reference to other Articles in the Chapter. Additional compliance with 4.1.4 required stating the Article number before the Part number in the Article.

Adding a reference to Class 4 systems improves usability since these systems are often used to power communications systems.

Adding a reference to the NESC improves usability since the NESC covers outside plant installations and coordinated with Article 800.



800. <del>2</del> – <u>3</u>	_Reconditioned Equipment.
The requi	rements of 110.21(A)(2) shall apply.
tatement of	Problem and Substantiation for Public Input
Style Manual 2.2.1 Parallel the same pur article does n the article. Required Par XXX.1 Scope XXX.2 Listing XXX.3 Recor XXX.3(A) Per XXX.3(B) No The Usability Chad Kenned	Section 2.2.1 regarding reconditioned equipment. Numbering Required. Technical committees shall use the following section numbers for poses within articles. This requirement shall not apply to Articles 90, 100, and 110. If the iot contain listing or reconditioning requirements, the subdivisions shall not be included in rallel Numbering Format g Requirements. Inditioned Equipment. rmitted to be Installed. t Permitted to be Installed. t Permitted to be Installed. Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, dy and David Williams. <b>Dermation Verification</b>
Submitter Fu	III Name: David Williams
Organizatior	Delta Charter Township
Street Addre	SS:
City:	
State: Zin:	
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Submittal Da	
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Public NFPA	Input No	o. 3446-NFPA 70-2023 [ Sec	tion No. 800.2 ]	
<del>800.2</del>	Reconditio	oned Equipment.		
The requ	uirements	<del>of 110.21(A)(2) shall apply.</del>		
Additional P	roposed	d Changes		
		File Name	Description	<u>Approved</u>
Limited_En	ergy_IG_	_First_Draft_Substantiation.docx	First Draft Substantiation	
Statement of	<sup>-</sup> Proble	m and Substantiation for P	ublic Input	
This text is relocated as <b>Submitter In</b>	being dele s a genera formatio	eted as part of the reorganization of al requirement to new Article X00. On Verification	the limited energy articles. The	e deleted text is
Submitter I	- ull Name	: Mark Hilbert		
Organizatio	on:	MR Hilbert Insp. & Training		
Street Add	ress:			
City:				
State:				
Submittal D	Date:	Sun Sep 03 06:14:01 EDT 2023		
Committee	:	NEC-P16		
Committee S	tateme	nt		
Resolution	: For clar practica text in t modify systems	ity, and ease-of-use it is more appr Il for communications systems expl he proposed X00 does not address 800.2 which concerns placing limits 5.	opriate to have as many require icitly in one article such as 800 the proposed revision of PI 36 on use of protectors in commu	ements as . The relocated 28 submitted to unications

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block





<u>800.18</u>	nstallation of Equipment.
<u>Equipme</u> listed in	nt electrically connected to a communications network shall be a cordance with 800.171.
<u>Exceptio</u> is intend qualified of telecc	n: This listing requirement shall not apply to test equipment that and for temporary connection to a telecommunications network by persons during the course of installation, maintenance, or repair mmunications equipment or systems.
atement of P	oblem and Substantiation for Public Input
The requireme	It to use listed equipment is a general requirement and should be in the general Art
(Article 800).	
elated Public	nputs for This Document
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Public Input N Public Input N Public Input N Ibmitter Infor Submitter Ful Organization: Affiliation: Street Addres City: State: Zip: Submittal Dat Committee:	Related Input       Relationship         0.1183-NFPA 70-2023 [Section No. 805.18]       Delets 805.18         0.1183-NFPA 70-2023 [Section No. 805.18]       Delets 805.18         mation Verification         Name: Leslie Jutte         Plastics Industry Association       Plastics Industry Association (PLASTICS)         :       Thu Jun 22 11:58:23 EDT 2023         NEC-P16       Net Provide ProvideProvide Provide Provide Provide ProvideProvide Provide
Public Input N Public Input N Public Input N Ibmitter Infor Submitter Ful Organization: Affiliation: Street Addres City: State: Zip: Submittal Dat Committee Sta	Name: Leslie Jutte   Plastics Industry Association   Plastics Industry Association   Plastics Industry Association (PLASTICS)
Public Input N Public Input N Public Input N Jubmitter Infor Submitter Ful Organization: Affiliation: Street Addres City: State: Zip: Submittal Dat Committee Sta Resolution: <u>I</u>	Related Input       Relationship         b. 1183-NFPA 70-2023 [Section No. 805.18]       Delets 805.18         b. 1183-NFPA 70-2023 [Section No. 805.18]       Delets 805.18         mation Verification       Name: Leslie Jutte         Plastics Industry Association       Plastics Industry Association (PLASTICS)         :       Thu Jun 22 11:58:23 EDT 2023 NEC-P16         ement       R-7552-NFPA 70-2024         be requirement to use listed equipment is a general requirement and has been moved

# Public Input No. 1708-NFPA 70-2023 [New Section after 800.3]

#### 800.9 Qualified Persons.

<u>Communications systems, circuits and equipment covered by Articles 805, 820, 830 and 840 shall be installed by qualified persons.</u>

Informational Note: See definition of Qualified Persons in Article 100.

## Statement of Problem and Substantiation for Public Input

Technology in the limited energy and communications system segments of the electrical industry is rapidly evolving and expanding and is becoming more complicated. These systems require far more training and experience. These systems are often part of essential electrical systems and critical operations power systems requiring a greater degree of training and experience, in design, planning, installation, and programing in many instances. These systems and others require trained qualified personnel and contractors. ANSI standards such as NFPA 72, NECA 301 and others, address these systems and include requirements that qualified persons perform installations of these systems and equipment, so these new NEC requirements are proposed to correlate and align with those ANSI-accredited industry standards and codes.

#### **Related Public Inputs for This Document**

#### **Related Input**

<u>Relationship</u>

Public Input No. 1706-NFPA 70-2023 [New Section after 770.3]
Public Input No. 1701-NFPA 70-2023 [New Section after 760.3]
Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]
Public Input No. 1695-NFPA 70-2023 [New Section after 725.3]
Public Input No. 1694-NFPA 70-2023 [New Section after 724.3]
Public Input No. 1690-NFPA 70-2023 [New Section after 722.3]
Public Input No. 1686-NFPA 70-2023 [New Section after 708.8]
Public Input No. 1684-NFPA 70-2023 [New Section after 701.7]
Public Input No. 1672-NFPA 70-2023 [New Section after 700.8]
Public Input No. 4394-NFPA 70-2023 [New Section after 625.6]
Public Input No. 1629-NFPA 70-2023 [New Section after 393.6]
Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)]
Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)]
Public Input No. 1629-NFPA 70-2023 [New Section after 393.6]
Public Input No. 1672-NFPA 70-2023 [New Section after 700.8]
Public Input No. 1684-NFPA 70-2023 [New Section after 701.7]
Public Input No. 1686 NEDA 70 2023 [Now Section after 708 8]
rubiic input No. 1000-NFFA 70-2023 [New Section alter 700.0]
Public Input No. 1690-NFPA 70-2023 [New Section after 702.3]
Public Input No. 1690-NFPA 70-2023 [New Section after 702.3] Public Input No. 1694-NFPA 70-2023 [New Section after 722.3]
Public Input No. 1690-NFPA 70-2023 [New Section after 702.3] Public Input No. 1694-NFPA 70-2023 [New Section after 722.3] Public Input No. 1695-NFPA 70-2023 [New Section after 725.3]
Public Input No. 1690-NFPA 70-2023 [New Section after 708.0] Public Input No. 1690-NFPA 70-2023 [New Section after 722.3] Public Input No. 1694-NFPA 70-2023 [New Section after 725.3] Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]
Public Input No. 1690-NFPA 70-2023 [New Section after 708.3] Public Input No. 1690-NFPA 70-2023 [New Section after 722.3] Public Input No. 1695-NFPA 70-2023 [New Section after 725.3] Public Input No. 1698-NFPA 70-2023 [New Section after 726.3] Public Input No. 1701-NFPA 70-2023 [New Section after 760.3]

# **Submitter Information Verification**

Submitter Full Name	: Kyle Krueger
Organization:	NECA
Affiliation:	NECA
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Fri Jul 28 20:56:59 EDT 2023
Committee:	NEC-P16

# **Committee Statement**

**Resolution:** The definition of a Qualified Person in Article 100 references "electrical equipment and installations"; which is for installers of electric light and power circuits, not communications circuits.

80	0.3 Other Articles.
On The cor	ly those sections of Chapters 1 through 7 referenced in Chapter 8 shall apply to Chapter 8. e definitions from Article 100 apply to Chapter 8. Installations of circuits and equipment sha nply with 800.3(A) through (I).
(A)	Output Circuits.
As bro bro follo	appropriate for the services provided, the output circuits derived from a network-powered adband communications system's network interface unit (NIU) or from a premises-powered adband communications system's network terminal shall comply with the requirements of th owing:
(1)	Installations of Class 2 and Class 3 circuits — Part II of Article 725 and Parts I and II of Article 722
(2)	Installations of power-limited fire alarm circuits — Part III of Article 760
(3)	Installations of optical fiber cables — Part V of Article 770
(4)	Installations of communications circuits — Part IV of Article 805
	Informational Note: The communications circuits covered by Article 805 are commonly referred to as POTS (plain old telephone service) circuits.
(5)	Installations of premises (within buildings) community antenna television and radio distribution circuits — Part V of Article 820
<u>(B</u> )	Spread of Fire or Products of Combustion.
Ins	tallation of communication circuits shall comply with 300.21.
<u>(C)</u>	Hazardous (Classified) Locations.
Circ 505	cuits and equipment installed in a location that is classified in accordance with 500.5 and 5.5 shall comply with the applicable requirements of Chapter 5.
( <del>C</del>	<b>D</b> ) Wiring in Ducts for Dust, Loose Stock, or Vapor Removal.
The	e requirements of 300.22(A) shall apply.
(Đ	E) Equipment in Other Space Used for Environmental Air.
The	e requirements of 300.22(C)(3) shall apply.
(E	E) Installation and Use.
The	e requirements of 110.3(B) shall apply.
(F	<u>G</u> ) Optical Fiber Cable.
Wh 770	ere optical fiber cable is used to provide a communications circuit within a building, Article ) shall apply.
( <del>G</del>	H) Vertical Support for Fire-Resistive Cables and Conductors.
Ver con 300	tical installations of circuit integrity (CI) cables and conductors installed in a raceway or ductors and cables of fire-resistive cable systems shall be installed in accordance with 0.19.
(H	I) Bonding and Grounding of Cable Shields.
The con	e requirements of 250.4(A)(5) shall apply to the metal shields of cables used for non-munications.

## Statement of Problem and Substantiation for Public Input

Added new requirement for spread of fire of communication circuits to be consistent with 722.3, 724.3, 725.3, and 760.3. Submitting another public input to remove 800.26 and simply add a reference to 300.21. This will improve usability and add clarity for Code users.

## **Submitter Information Verification**

Submitter Full Name: Mike HoltOrganization:Mike Holt Enterprises IncStreet Address:City:City:State:State:Ved Aug 30 10:32:28 EDT 2023Committee:NEC-P16

## **Committee Statement**

**Resolution:** Since communications circuits include optical fiber cable and Section 300.21 only applies to electrical installations, the revisions of the PI have not been adopted.

As bro follo	appropriate for adband comm adband comm owing:	r the services provided, the output circuits derived from a network-powered unications system's network interface unit (NIU) or from a premises-powered unications system's network terminal shall comply with the requirements of the
	<u>Article 722,</u> F	Parts I and II- of Article 722
(2)	Installations of	of power-limited fire alarm circuits — <u>Article 770,</u> Part III- <del>of Article 760</del>
(3)	Installations of	of optical fiber cables — <del>Part V of</del> Article <u>770 , Part V</u>
(4)	Installations of	of communications circuits — <del>Part IV of</del> Article <u>805 , Part IV</u>
	Informa commo	ational Note: The communications circuits covered by Article 805 are only referred to as POTS (plain old telephone service) circuits.
(5)	Installations of distribution ci	of premises (within buildings) community antenna television and radio rcuits — <del>Part V of</del> -Article <u>820 , Part V</u>
tatemen This P in orde Style N 4.1.4 F Article articles numbe	nt of Proble ublic Input is b r to provide co Aanual Section References to a 100 or where shall be perm r shall precede	eing submitted on behalf of the NEC Correlating Committee Usability Task Group orrelation throughout the document. The text is revised to to comply with the NE 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article e the part number.
tatemen This P in orde Style N 4.1.4 F Article articles numbe The Us Chad F ubmitte	nt of Proble ublic Input is b er to provide co Manual Section References to a 100 or where shall be perme shall precede sability Task Gi Kennedy and I	eing submitted on behalf of the NEC Correlating Committee Usability Task Group orrelation throughout the document. The text is revised to to comply with the NE of 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within nitted. References to all parts of an article shall not be permitted. The article e the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams.
tatemen This P in orde Style M 4.1.4 F Article articles numbe The Us Chad F ubmitte	nt of Proble ublic Input is b er to provide co Aanual Section References to a 100 or where shall be permer shall precede sability Task Gi Kennedy and I er Information	eing submitted on behalf of the NEC Correlating Committee Usability Task Group orrelation throughout the document. The text is revised to to comply with the NE of 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article e the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams.
tatemen This P in orde Style N 4.1.4 F Article articles numbe The Us Chad F ubmitte Submi Organ	nt of Proble ublic Input is b er to provide cc Aanual Section References to a 100 or where s shall be perm er shall precede sability Task Gi kennedy and I er Information tter Full Name ization:	eing submitted on behalf of the NEC Correlating Committee Usability Task Group orrelation throughout the document. The text is revised to to comply with the NE of 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article e the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams. <b>on Verification</b> e: David Williams Delta Charter Township
tatemen This P in orde Style M 4.1.4 F Article articles numbe The Us Chad H ubmitte Submi Organ Street	nt of Proble ublic Input is b r to provide cc Aanual Section References to a 100 or where shall be perm r shall precede sability Task Gi (ennedy and l r Informatic tter Full Name ization: Address:	eing submitted on behalf of the NEC Correlating Committee Usability Task Group orrelation throughout the document. The text is revised to to comply with the NE 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams. <b>on Verification</b> e: David Williams Delta Charter Township
tatemen This P in orde Style M 4.1.4 F Article articles numbe The Us Chad F ubmitte Submi Organ Street City:	nt of Proble ublic Input is b er to provide co Aanual Section References to a 100 or where s shall be permer shall precede sability Task Gi Kennedy and I er Information tter Full Name ization: Address:	eing submitted on behalf of the NEC Correlating Committee Usability Task Group orrelation throughout the document. The text is revised to to comply with the NE of 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article e the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams. <b>on Verification</b> e: David Williams Delta Charter Township
tatemen This P in orde Style N 4.1.4 F Article articles numbe The Us Chad F ubmitte Submi Organ Street City: State:	nt of Proble ublic Input is b er to provide cc Aanual Section References to a 100 or where s shall be permer shall precede sability Task Gi Kennedy and H er Information tter Full Name ization: Address:	eing submitted on behalf of the NEC Correlating Committee Usability Task Group prelation throughout the document. The text is revised to to comply with the NE 0.4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article e the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams. <b>on Verification</b> e: David Williams Delta Charter Township
tatemei This P in orde Style M 4.1.4 F Article articles numbe The Us Chad H ubmitte Submi Organ Street City: State: Zip:	nt of Proble ublic Input is b er to provide co Aanual Section References to a 100 or where shall be permer shall precede sability Task Gi Kennedy and I er Information tter Full Name ization: Address:	eing submitted on behalf of the NEC Correlating Committee Usability Task Group prelation throughout the document. The text is revised to to comply with the NE 0.4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within hitted. References to all parts of an article shall not be permitted. The article the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter David Williams. <b>on Verification</b> e: David Williams Delta Charter Township
tatemei This Pi in orde Style M 4.1.4 F Article articles numbe The Us Chad F Ubmitte Submi Organ Street City: State: Zip: Submi Comm	nt of Proble ublic Input is b er to provide cc Aanual Section References to a 100 or where s shall be permer shall precede sability Task Gi (ennedy and line) er Information tter Full Name ization: Address: ttal Date: ittee:	eing submitted on behalf of the NEC Correlating Committee Usability Task Gro prelation throughout the document. The text is revised to to comply with the NE of 4.1.4, regarding the use of Parts. an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within itted. References to all parts of an article shall not be permitted. The article e the part number. roup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunte David Williams. <b>on Verification</b> e: David Williams Delta Charter Township Mon Aug 28 13:23:01 EDT 2023 NEC-P16

New item (2) has been added since Class 4 circuits can be derived from a network-powered broadband circuit.

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Pub NFPA	lic Input No. 4178-NFPA 70-2023 [ Section No. 800.3(A) ]
(A)	Output Circuits.
As a broa broa follo	ppropriate for the services provided, the output circuits derived from a network-powered dband communications system's network interface unit (NIU) or from a premises-powered dband communications system's network terminal shall comply with the requirements of the wing:
(1)	Installations of Class 2 and Class 3 circuits — Part II of Article 725 and Parts I and II of Article 722
(2)	Installations of Class 4 circuits — Part II of Article 726 and Parts I and II of Article 722
(3)	Installations of power-limited fire alarm circuits — Part III of Article 760
(4)	Installations of optical fiber cables — Part V of Article 770
(5)	Installations of communications circuits — Part IV of Article 805
	Informational Note: The communications circuits covered by Article 805 are commonly referred to as POTS (plain old telephone service) circuits.
(6)	Installations of premises (within buildings) community antenna television and radio distribution circuits — Part V of Article 820
Adding than fire in the co 2023 co Submitter	Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or bette and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class ode to see if Class 4 was also appropriate in the application should have happened for the de and not doing it was an oversight.
Cubraiti	ter Full Name: Chad Janaa
Organiz	ration: Cisco Systems
Street A	address:
City:	
State:	
Zip:	
Submit	tal Date: Wed Sep 06 19:34:49 EDT 2023
Commi	tee: NEC-P16
Committe	e Statement
Resolu	tion: <u>FR-7950-NFPA 70-2024</u>
Statem	ent: Compliance with 4.1.4 of the NEC Style Manual requires stating the Article number before the Part number in the Article.
	New item (2) has been added since Class 4 circuits can be derived from a network- powered broadband circuit.

Public Input No	o. 820-NFPA 70-2023 [ Sect	tion No. 800.3(A) ]
(A) Output Circuit	S.	
As appropriate for broadband commu broadband commu following:	the services provided, the output inications system's network interf inications system's network termi	circuits derived from a network-powered ace unit (NIU) or from a premises-powered nal shall comply with the requirements of the
(1) Installations o Parts I and II	f Class 2 and Class 3 circuits — <del>f</del>	Part II of Article 725, Part II and Article 722,
(2) <u>Installations</u> of	of <u>Class 4 circuits -</u> Article <u>726, Pa</u>	art II and Article 722, Parts I and II
(3) Installations o	f power-limited fire alarm circuits	— <del>Part III of</del> Article 760 <u>, Part III</u>
(4) Installations o	f optical fiber cables — <del>Part V of</del> -	Article,_ 770, <u>Part V</u>
(5) Installations o	f communications circuits — <u>Artic</u>	<u>le 800,</u> Part IV- <del>of Article 805</del>
Informati commor	ional Note: The communications	circuits covered by Article 805 are telephone service) circuits.
(6) <u>Installations o</u> <u>distribution cir</u>	<u>f premises (within buildings) comi cuits —</u>	munity antenna television and radio
Part V of		
•		
• <u>Article 820 , Pa</u>	art V	
Statement of Problem	n and Substantiation for F	Public Input
Class 4 circuits can be	e derived from a network-powered	d broadband circuit.
The installation rules f	or communications cables were r	noved to Article 800 in the 2023 NEC
The references to othe 4.1.4 which states, "T	er Articles have been revised to c he article number shall precede th	omply with the 2023 NEC Style Manual section ne part number."
Related Public Input	s for This Document	
<u>Public Input No. 819- 800.1]</u>	Related Input NFPA 70-2023 [Section No.	<b>Relationship</b> Refer to Class 4 wiring in informational note
Public Input No. 819- 800.1]	NFPA 70-2023 [Section No.	
Submitter Information	n Verification	
Submitter Full Name	: David Kiddoo	
Organization:	CCCA	
Affiliation:	Communications Cable & Conne	ectivity Association
Street Address:		
City:		

State: Zip:	
Submittal Da	te: Sat May 13 08:49:58 EDT 2023
Committee:	NEC-P16
Committee St	atement
Resolution:	<u>FR-7950-NFPA70-2024</u>
Statement:	Compliance with 4.1.4 of the NEC Style Manual requires stating the Article number before the Part number in the Article.
	New item (2) has been added since Class 4 circuits can be derived from a network- powered broadband circuit.

Public Inp	out No. 3999-NFPA 70-2023 [ Section No. 800.3(B) ]
(B) Hazaro	lous (Classified) Locations.
Circuits and 505.5 shall <u>HERE</u> .	equipment installed in a location that is classified in accordance with 500.5 and comply with the applicable requirements of <del>Chapter 5</del> <u>NOT SURE WHAT TO PUT</u>
Statement of P	roblem and Substantiation for Public Input
"the appropriate articles. A chap appropriate rep the correct ans	e requirements of Chapter 5" violates the style guide restriction of calling out whole ter is a collection of articles, therefore it must be disallowed. I don't know the lacement text. I'm hoping the panel can reach out to the appropriate CMP (14?) and get wer.
Submitter Infor	mation Verification
Submitter Full	Name: Chad Jones
Organization:	Cisco Systems
Street Address	S:
City:	
State:	
Zip:	
Submittal Date	e: Wed Sep 06 13:17:09 EDT 2023
Committee:	NEC-P16
Committee Stat	ement
Resolution: T	he submitter of the proposal has not provided a technical change, as required by the .3.4.1 of the Regulations.

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Public Ir	put No. 3447-NFPA 70-2023 [ Sections 800.3(B), 800.3(C), 800.3(D) ]
NFPA	
Sections	<del>800.3(B), 800.3(C), 800.3(D)</del>
(B) Haz	ardous (Classified) Locations.
<del>Circuits a</del> <del>505.5</del> -sha	<del>nd equipment installed in a location that is classified in accordance with 500.5 and</del> all comply with the applicable requirements of Chapter 5 <del>.</del>
<del>(C)</del> − <del>Wiri</del> i	<del>ng in Ducts for Dust, Loose Stock, or Vapor Removal.</del>
The requi	rements of 300.22(A) -shall apply.
<del>(D)</del> – <del>Equ</del>	pment in Other Space Used for Environmental Air.
The requi	rements of <del>300.22(C)(3)</del> -shall apply.
Additional Pro	posed Changes
Limited Ene	<u>rav</u> TC First Draft Substantiation docy First Draft Substantiation
This text is be relocated as	Problem and Substantiation for Public Input eing deleted as part of the reorganization of the limited energy articles. The deleted text is a general requirement to new Article X00.
Submitter Fi	ull Name: Mark Hilbert
Organization	MR Hilbert Insp. & Training
Street Addre	SS:
City:	
State:	
Zip:	
Submittal Da	Ite: Sun Sep 03 06:15:14 EDT 2023
Committee:	NEC-P16
Committee St	atement
Resolution:	The text from Article 800.3 is not relocated but deleted from the new Article X00 under PI 3234. There is no technical justification supplied for the deletion of the requirement. The reference in current 800.3 to sealing requirements in 501.15, 502.15, 505.16, or 506.16 were deleted as well as any reference to 300.22A for optical fiber cables used in Ducts for dust, loose stock, or vapor removal.

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



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Public II	nput No. 2564-NFPA 70-2023 [ Section No. 800.3(C) ]		
(C) Wirir	ng in Ducts for Dust, Loose Stock, or Vapor Removal.		
The requi <u>coaxial ca</u>	rements of 300.22(A) shall apply <u>to communications wires and cables, CATV-type</u> ables, network-powered broadband communications cables, and conductive optical		
fiber cabl	<u>es.</u>		
Statement of	Statement of Problem and Substantiation for Public Input		
The revised	text clarifies which of the cables used for communications that 300.22(A) applies to.		
Submitter Infe	ormation Verification		
Submitter F	ull Name: Leslie Jutte		
Organizatio	n: Plastics Industry Association		
Affiliation:	Plastics Industry Association (PLASTICS)		
Street Addre	ess:		
City:			
State:			
Submittal D	ate: Tue Aug 22 09:27:24 EDT 2023		
Committee:	NEC-P16		
Committee St	atement		
Resolution:	FR-7618-NFPA 70-2024		
Statement:	The revised text clarifies which of the cables, used for communications, 300.22(A) applies to.		

(E) Installation	and Use. <u>of Equipment</u>	
The requirement	its of 110.3(B) shall apply.	
Statement of Prob	Statement of Problem and Substantiation for Public Input	
The recommended of the section, 110.	text of title of 800.3(E) is expanded to include "equipment" to correlate with the title 3.	
Submitter Informa	tion Verification	
Submitter Full Nar	me: Leslie Jutte	
Submitter Full Nar Organization:	me: Leslie Jutte Plastics Industry Association	
Submitter Full Nar Organization: Affiliation:	me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)	
Submitter Full Nar Organization: Affiliation: Street Address:	<b>me:</b> Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)	
Submitter Full Nar Organization: Affiliation: Street Address: City:	me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)	
Submitter Full Nar Organization: Affiliation: Street Address: City: State:	me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)	
Submitter Full Nar Organization: Affiliation: Street Address: City: State: Zip:	me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)	

Public Ir	Public Input No. 1181-NFPA 70-2023 [ Section No. 800.3(F) ]		
	cal Fiber Cable		
Where op <del>770 shall</del>	Where optical fiber cable is used to provide a communications circuit within a building, Article 770 shall apply.		
Statement of	Problem and Substantiation for Public Input		
Multiple PIs I communicati to Article 770	have been submitted to include optical fiber cables in Article 800 when they are used for ons, thereby increasing the usability of Article 800 and eliminating the need for a reference ) in 800.3, "Other Articles".		
Submitter Info	ormation Verification		
Submitter F	ull Name: Leslie Jutte		
Organizatio	n: Plastics Industry Association		
Affiliation:	Plastics Industry Association (PLASTICS)		
Street Addre	ess:		
City:			
State:			
Zip:			
Submittal Da	ate: Thu Jun 22 11:52:46 EDT 2023		
Committee:	NEC-P16		
Committee St	atement		
Resolution:	FR-7620-NFPA 70-2024		
Statement:	This revision aligns with the committee panel's actions to not include optical fiber cables in Article 800 when they are used for communications, thereby increasing the usability of Article 800 and eliminating the need for a reference to Article 770.		

# Public Input No. 3382-NFPA 70-2023 [New Section after 800.3(H)]

#### 800.3 (I) Circuits with Communications and Power

<u>Circuits carrying data and power shall be classified as electrical power circuits in accordance with the type of electrical power carried.</u>

Informational Note: Communications circuits carrying power in accordance with Part II of article 805, 820.15, 830.15, or 840.160 are considered according to their appropriate article for each type of circuit.

## Statement of Problem and Substantiation for Public Input

The broadening of the definition of communications circuit in the 2023 code cycle (to eliminate connection to the communications service provider) makes 800.3(A) inapplicable to a variety of premises circuits with both communications and power. 800.3(A) only applies to Output Circuits from a Network Interface Unit (NIU) or a Network Terminal (NT) - devices which interface to a carrier. In contrast, circuits carrying power and data can be local area network circuits, such as Ethernet, and are provided not from a network terminal but from a local area network switch. Circuits carrying data and power may be provided by powerline communications, and these are now routinely installed to bridge internet connections to systems such as surveillance, security, and local data systems such as wifi access points. Under the current definition, these applications could be considered communications circuits, so it is important to make it clear that when they carry power, the requirements of the power circuit still apply.

A related PI adds an informational note to the definition of communications circuit to make it clear that a circuit may both meet the definition of a communications circuit and of another circuit type in the code.

Additionally, it is also important to make it clear that chapter 8 includes certain classes of powering circuits with their own treatment. The informational note points out that these are not the subject of the reference to other article, and points out the powered circuits handled in chapter 8, including coaxial, network-powered broadband, premises-powered broadband, and POTS (article 800) circuits, protecting these traditional communications applications.

## **Related Public Inputs for This Document**

Related Input
Public Input No. 3378-NFPA 70-2023 [Definition: Communications
Circuit.]
Public Input No. 3378-NFPA 70-2023 [Definition: Communications
Circuit.]

## **Submitter Information Verification**

Submitter Full Name: George ZimmermanOrganization:CME Consulting, Inc.Affiliation:SelfStreet Address:City:State:State:

#### **Relationship**

Associated Definition

Zip:Submittal Date:Fri Sep 01 16:39:54 EDT 2023Committee:NEC-P16

## **Committee Statement**

Resolution: FR-7621-NFPA 70-2024

Statement: The new text adds clarity on the classification of dual power and communications circuits.

	ublic Ir	nput No. 1007-NFPA 70-2023 [ Section No. 800.3(H) ]
<del>(</del>	H) Bon	ding and Grounding of Cable Shields.
Ŧ	he requi	rements of 250.4(A)(5) shall apply to the metal shields of cables used for cations.
Statem	ent of	Problem and Substantiation for Public Input
This new	is a com 800.114	panion Public Input to PI 1006 which moves the cable shield grounding requirements to
Related	d Publi	c Inputs for This Document
<u>Pub</u> after	<u>lic Input</u> r 800.113	Related InputRelationshipNo. 1006-NFPA 70-2023 [New SectionMoves shield grounding to new section 800.114.
Submit	ter Info	ormation Verification
Subr	mitter Fu	III Name: David Kiddoo
Orga	anizatior	n: CCCA
Affili	iation:	Communications Cable & Connectivity Association
Stree	et Addre	SS:
City:	:	
State	e:	
Zip:		
Subi	mittal Da	NEC P16
Com	innittee.	NEC-PTO
Commi	ittee St	atement
Res	olution:	FR-7769-NFPA 70-2024
State	ement:	A new section of bonding and grounding requirements for communication cables has been created, which makes 800.3(H) no longer needed. See action taken on PI-1006, PI-2482, PI-4069.
Public I	nput No. 2503-NFPA 70-2023 [ Section No. 800.3(H) ]	
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<del>(H)</del> Bon	ding and Grounding of Cable Shields.	
<del>The requ</del> <del>communi</del>	irements of 250.4(A)(5) shall apply to the metal shields of cables used for cations.	
Statement of	Problem and Substantiation for Public Input	
Yo u can't co circuit break	omply with 250.4(A)(5) if you do not have an overcurrent device or ground detector. What er or fuse is supposed to open should the cable's sheilding become energized?	
Submitter Inf	ormation Verification	
Submitter F	ull Name: Ryan Jackson	
Organizatio	n: Self-employed	
Street Addre	ess:	
City:		
State:		
Zip:		
Submittal D	ate: Fri Aug 18 13:00:21 EDT 2023	
Committee:	NEC-P10	
Committee St	tatement	
Resolution:	<u>FR-7769-NFPA 70-2024</u>	
Statement:	A new section of bonding and grounding requirements for communication cables has been created, which makes 800.3(H) no longer needed. See action taken on PI-1006, PI-2482, PI-4069.	

Public li	nput No. 3196-NFPA 70-2023 [ Section No. 800.3(H) ]
<del>(H)</del> Bon	ding and Grounding of Cable Shields.
<del>The requi</del> <del>communi</del>	irements of 250.4(A)(5) shall apply to the metal shields of cables used for cations.
Statement of	Problem and Substantiation for Public Input
Removing 80 path which h grounding ar add clarity fo	00.3(H) because it references 240.4(A)(5) which is about the effective ground-fault current as nothing to do with grounding and bonding of cable shields; the proper requirements for nd bonding of cable shields are already located in 800.100. This will improve usability and pr Code users.
Submitter Inf	ormation Verification
Submitter F	ull Name: Mike Holt
Organizatio	n: Mike Holt Enterprises Inc
Street Addre	ess:
City:	
State: Zin:	
Submittal D	ate: Wed Aug 30 10:31:21 EDT 2023
Committee:	NEC-P16
Committee St	tatement
<b>Resolution:</b>	<u>FR-7769-NFPA 70-2024</u>
Statement:	A new section of bonding and grounding requirements for communication cables has been created, which makes 800.3(H) no longer needed. See action taken on PI-1006, PI-2482, PI-4069.

Public I	nput No	o. 4071-NFPA 70-2023 [ Section No. 80	0.3(H) ]
<del>(H)</del> Bon	iding and	Grounding of Cable Shields.	
<del>The requ</del> <del>communi</del>	<del>irements</del> <del>cations.</del>	of 250.4(A)(5) shall apply to the metal shields o	<del>f cables used for</del>
Statement of	Proble	m and Substantiation for Public Input	
The requirer "because sh approval of f and required and as modi	nent to be ields cou PI 4069), I groundii fied withi	ond or ground a communications cable shield wa ld become energized and thereby pose a fire or s Article 800.3(H) is no longer required as all locat ng/bonding methods to mitigate the risk are provi n Articles 805-840 inclusively.	s added to the 2023 NEC shock hazard". However, with the ions for communication cables ded within Part III of Article 800
Related Publi	ic Input	s for This Document	
Public Input	: No. 406	Related Input 9-NFPA 70-2023 [New Section after 800.106]	<u>Relationship</u> Dependent
Submitter Inf	ormatio	on Verification	
Submitter F	ull Name	: Jeff Silveira	
Organizatio	n:	Bicsi	
Street Addro	ess:		
City: State:			
Zip:			
Submittal D	ate:	Wed Sep 06 15:37:09 EDT 2023	
Committee:		NEC-P16	
Committee S	tateme	nt	
<b>Resolution:</b>	<u>FR-776</u>	9-NFPA 70-2024	
Statement:	A new s been cro 2482, P	ection of bonding and grounding requirements fo eated, which makes 800.3(H) no longer needed. I-4069.	r communication cables has See action taken on PI-1006, PI-

Public NFPA	c Input N	o. 3448-NFPA 70-2023 [ Sec	tion No. 800.21 ]		
<del>800.2</del>	800.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.				
Acces prever	Access to electrical equipment shall not be denied by an accumulation of wires and cables that prevents removal of panels, including suspended ceiling panels.				
Additional	Proposed	d Changes			
Limited_E	Energy_TG	<u>File Name</u> _First_Draft_Substantiation.docx	Description First Draft Substantiation	<u>Approved</u>	
Statement	of Proble	m and Substantiation for P	ublic Input		
This text i relocated	s being del as a gener	eted as part of the reorganization of a requirement to new Article X00.	f the limited energy articles. The	e deleted text is	
Submitter I	nformatio	on Verification			
Submitte	r Full Name	e: Mark Hilbert			
Organiza	tion:	MR Hilbert Insp. & Training			
Street Ad	dress:				
City: State:					
Zip:					
Submitta	I Date:	Sun Sep 03 06:16:46 EDT 2023			
Committe	ee:	NEC-P16			
Committee	Committee Statement				
Resolutio	on: For clar require 800.	ity, ease-of-use, and avoiding conf ments as practical for communicati	usion it is more appropriate to ha	ave as many icle such as	

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



General. uits and equipment shall be installed in a neat and workmanlike manner. Cables installed osed on the surface of ceilings and sidewalls shall be supported by the building structure
uits and equipment shall be installed in a neat and workmanlike manner. Cables installed osed on the surface of ceilings and sidewalls shall be supported by the building structure
n a manner that the cable will not be damaged by normal building use. Such cables shall ured by hardware, including straps; staples: cable ties listed and identified for securement support; and hangers, or similar fittings, designed and installed so as not to damage the le. The installation shall also conform to 300.4 and 300.11. Plenum cable ties and other metallic cable accessories used to secure and support cables in other spaces used for ironmental air (plenums) shall be listed as having low smoke and heat release properties ordance with 800.170.
Informational Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568. E-2020, Commercial Building Telecommunications Infrastructure Standard; ANSI/TIA- 569-E-2019, 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-A- 2017, Healthcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- 2014, Telecommunications Infrastructure Standard for Educational Facilities; and other ANSI-approved installation standards for accepted industry practices.
Informational Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air-Conditioning and Ventilating Systems</i> , for discrete combustible components installed in accordance with 300.22(C).
Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or othe contaminants may result in an undetermined alteration of wire and cable properties.
- <del>Circuit</del> _ <u>Workmanship.</u>
<u>cuits, Cables and equipment shall be mechanically executed and installed in a</u>
prmational Note No. 1: See definition of <i>Workmanship</i> in Article 100.
prmational Note No. 2: See Section 110.12 for more information on Workmanship.
Circuit Integrity (CI) Cable.
able shall be supported at a distance not exceeding 610 mm (24 in.). Cable shall be ured to the noncombustible surface of the building structure. Cable supports and fastener II be steel.

See Companion PIs pertaining to Sections:

- Article 100 Definition of "Workmanship"
- 110.12
- 393.24
- 600.24
- 600.33(B) 724.22
- 724.24
- 725.24
- 726.24
- 760.24
- 770.24

## **Related Public Inputs for This Document**

## Related Input

**Relationship** 

Public Input No. 1707-NFPA 70-2023 [Section No. 770.24]
Public Input No. 1702-NFPA 70-2023 [Section No. 760.24]
Public Input No. 1700-NFPA 70-2023 [Section No. 726.24]
Public Input No. 1699-NFPA 70-2023 [New Section after 726.12]
Public Input No. 1697-NFPA 70-2023 [Section No. 725.24]
Public Input No. 1696-NFPA 70-2023 [New Section after 725.21]
Public Input No. 1691-NFPA 70-2023 [Section No. 724.24]
Public Input No. 1692-NFPA 70-2023 [New Section after 724.21]
Public Input No. 1687-NFPA 70-2023 [Section No. 722.24]
Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)]
Public Input No. 1668-NFPA 70-2023 [Section No. 600.24]
Public Input No. 1669-NFPA 70-2023 [New Section after 600.24]
Public Input No. 1632-NFPA 70-2023 [New Section after 393.21]
Public Input No. 1630-NFPA 70-2023 [Section No. 393.14]
Public Input No. 1596-NFPA 70-2023 [Section No. 110.12]
Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work
Surface.]
Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work]
Public Input No. 1596-NEPA 70-2023 [Section No. 110 12]
Public Input No. 1630-NEPA 70-2023 [Section No. 393 14]
Public Input No. 1632-NEPA 70-2023 [New Section after 393 21]
Public Input No. 1668-NEPA 70-2023 [Section No. 600 24]
Public Input No. 1669-NEPA 70-2023 [New Section after 600 24]
Public Input No. 1670-NEPA 70-2023 [Section No. 600.33(B)]
Public Input No. 1687-NEPA 70-2023 [Section No. 722 24]
Public Input No. 1692-NEPA 70-2023 [New Section after 724 21]
Public Input No. 1696-NEPA 70-2023 [New Section after 725 21]
Public Input No. 1697-NEPA 70-2023 [Section No. 725 24]
Public Input No. 1699-NEPA 70-2023 [New Section after 726 12]
Public Input No. 1700-NEPA 70-2023 [Section No. 726 24]
Public Input No. 1702-NFPA 70-2023 [Section No. 760 24]
Public Input No. 1707-NFPA 70-2023 [Section No. 770 24]

# **Submitter Information Verification**

Submitter Full Name	Submitter Full Name: Kyle Krueger				
Organization:	NECA				
Affiliation:	NECA				
Street Address:					
City:					
State:					
Zip:					
Submittal Date:	Fri Jul 28 21:00:26 EDT 2023				
Committee:	NEC-P16				
Committee Statement					

**Resolution:** The term "workmanship" is not a defined term in Article 100.

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 such a manner that the cable will not be damaged by normal building use. Such cables shall secured by hardware, including straps; staples: cable ties listed and identified for securemen and support, and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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 accordance with 800.170. Informational Note No. 1: See ANSI/BICSI N1-2019, <i>Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure;</i> StANSI/TIA-568. E-2020, <i>Commercial Building Telecommunications Infrastructure Standard;</i> ANSI/TIA-506-2019, <i>Telecommunications Infrastructure Standard;</i> ANSI/TIA-506-2019, <i>Telecommunications Infrastructure Standard;</i> ANSI/TIA-500-C-2012, <i>Residential Telecommunications Infrastructure Standard for Educational Facilities;</i> ANSI/NECA/FOA 301-2016, <i>Standard for Installing, and. Testing Fiber Optic Cables</i> , ANSI/TIA-568.0-D-2015, <i>Generic Telecommunications Cabling for Customer Premises</i> , and ANSI/TIA-568.0-D-2016, <i>Optical Fiber Cabling and Components Standard</i> , and other ANS approved installation standards for accepted industry practices. Informational Note No. 2: See NFPA 90A-2024 , <i>Standard for the Installation of Air- Conditioning and Ventilating Systems</i> , 8:5.5.6. for listing information for discrete combustible components installed in accordance with 300.22(C). Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or othe contaminants may result in an undetermined alteration of wire and cable properties. <b>ettees</b> "Unless the standard." he edition of the standard." he require	(A) General.	
Informational Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-569-E-2019, Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, Residential Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, Telecommunications Infrastructure Standard for Industrial Premises; ANSI/TIA-1179-A 2017, Healthcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- 2014, Telecommunications Infrastructure Standard for Educational Facilities; ANSI/NECA/FOA 301-2016, Standard for Installing, and Testing Fiber Optic Cables , 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 , and other ANS approved installation standards for accepted industry practices. Informational Note No. 2: See NFPA 90A-2024 , Standard for the Installation of Air- Conditioning and Ventilating Systems, <u>8.5.5.6</u> for listing information for discrete combustible components installed in accordance with 300.22(C). Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or othe contaminants may result in an undetermined alteration of wire and cable properties. <b>Exercises of Problem and Substantiation for Public Input</b> Multiple PIs have been submitted to include optical fiber cables in Article 800 when they are used ommunications, thereby increasing the usability of Article 800. The edition of the standard." The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 test edition of the standard." The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 to the current (2024) edition of NFPA 90A. <b>mitter Information Verification</b> <b>ubmitter Full Name:</b> Leslie Jutte <b>"ganization:</b> Plastics Industry Association <b>filletice:</b> Plastics Industry Association	Circuits and equestion of the exposed on the such a manner is secured by hard and support; an cable. The instanonmetallic cab environmental a accordance with	ipment shall be installed in a neat and workmanlike manner. Cables installed surface of ceilings and sidewalls shall be supported by the building structure is that the cable will not be damaged by normal building use. Such cables shall be lware, including straps; staples: cable ties listed and identified for securement d hangers, or similar fittings, designed and installed so as not to damage the llation shall also conform to 300.4 and 300.11. Plenum cable ties and other le accessories used to secure and support cables in other spaces used for ir (plenums) shall be listed as having low smoke and heat release properties in 800.170.
Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or othe contaminants may result in an undetermined alteration of wire and cable properties.  ement of Problem and Substantiation for Public Input  Multiple PIs have been submitted to include optical fiber cables in Article 800 when they are used ommunications, thereby increasing the usability of Article 800.  The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the IEC states "Unless the standard reference includes a date, the reference is to be considered as atest edition of the standard."  The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 in the current (2024) edition of NFPA 90A.  mitter Information Verification  ubmitter Full Name: Leslie Jutte  rganization: Plastics Industry Association  filicitien: Plastics Industry Association	Informatio Telecomm E-2020, C 569-E-201 Residentia Telecomm 2017, Hea 2014, Tele <u>ANSI/NEC ANSI/TIA</u> approved Informatio Conditioni combustib	nal Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for nunications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568. Commercial Building Telecommunications Infrastructure Standard; ANSI/TIA- 19, Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, al Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, nunications Infrastructure Standard for Industrial Premises; ANSI/ TIA-1179-A- althcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- ecommunications Infrastructure Standard for Educational Facilities; CA/FOA 301-2016, Standard for Installing and Testing Fiber Optic Cables, -568.0-D-2015, Generic Telecommunications Cabling for Customer Premises, and 568.3-D-2016, Optical Fiber Cabling and Components Standard, and other ANSI installation standards for accepted industry practices. nal Note No. 2: See NFPA 90A-2021, Standard for the Installation of Air- ing and Ventilating Systems, 8.5.5.6 for listing information for discrete ole components installed in accordance with 300.22(C).
Aultiple PIs have been submitted to include optical fiber cables in Article 800 when they are user ommunications, thereby increasing the usability of Article 800. The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the IEC states "Unless the standard reference includes a date, the reference is to be considered as atest edition of the standard." The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 in the current (2024) edition of NFPA 90A. <b>mitter Information Verification</b> <b>ubmitter Full Name:</b> Leslie Jutte <b>rganization:</b> Plastics Industry Association	Informatio contamina	nal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or othe ants may result in an undetermined alteration of wire and cable properties.
Aultiple PIs have been submitted to include optical fiber cables in Article 800 when they are use ommunications, thereby increasing the usability of Article 800. The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the IEC states "Unless the standard reference includes a date, the reference is to be considered as atest edition of the standard." The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 in the current (2024) edition of NFPA 90A. <b>mitter Information Verification</b> <b>ubmitter Full Name:</b> Leslie Jutte <b>rganization:</b> Plastics Industry Association		
The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the IEC states "Unless the standard reference includes a date, the reference is to be considered as atest edition of the standard." The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 in the current (2024) edition of NFPA 90A. <b>mitter Information Verification</b> <b>ubmitter Full Name:</b> Leslie Jutte <b>irganization:</b> Plastics Industry Association <b>filiation</b>	ement of Prob	em and Substantiation for Public Input
The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 have been moved to 8 in the current (2024) edition of NFPA 90A.	ement of Prob Iultiple PIs have b ommunications, th	een submitted to include optical fiber cables in Article 800 when they are used ereby increasing the usability of Article 800.
witter Information Verification         ubmitter Full Name: Leslie Jutte         irganization:       Plastics Industry Association         filiation:       Plastics Industry Association	ement of Prob Aultiple PIs have b ommunications, th The edition date for IEC states "Unless atest edition of the	lem and Substantiation for Public Input een submitted to include optical fiber cables in Article 800 when they are used hereby increasing the usability of Article 800. • NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the s the standard reference includes a date, the reference is to be considered as standard."
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mittal Da	ate: Thu Jun 22 12:09:02 EDT 2023
nmittee:	NEC-P16
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olution:	FR-7581-NFPA 70-2024
ement:	The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.
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	Additional standards were added to Informational Note No. 1 to improve usability.
	Section 800.24(A) was subdivided to comply with section 3.5.1.2 of the NEC Style Manual.
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(A) General.	
Circuits and equi manner skillful m be supported by normal building u ties listed and ide and installed so a 300.11. Plenum o cables in other sy and heat release	pment shall be installed in a neat professional and workmanlike anner. Cables installed exposed on the surface of ceilings and sidewalls shall the building structure in such a manner that the cable will not be damaged by use. Such cables shall be secured by hardware, including straps; staples: cable entified for securement and support; and hangers, or similar fittings, designed as not to damage the cable. The installation shall also conform to 300.4 and cable ties and other nonmetallic cable accessories used to secure and support baces used for environmental air (plenums) shall be listed as having low smok properties in accordance with 800.170.
Information Telecommu E-2020, Co 569-E-2019 Residentia Telecommu 2017, Heal 2014, Teleo ANSI-appro	al Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for unications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568.1- ommercial Building Telecommunications Infrastructure Standard; ANSI/TIA- 9, Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, 1 Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, unications Infrastructure Standard for Industrial Premises; ANSI/TIA-1179-A- thcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- communications Infrastructure Standard for Educational Facilities; and other by distallation standards for accepted industry practices.
Information Conditionir accordance	al Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air-</i> og and Ventilating Systems, for discrete combustible components installed in e with 300.22(C).
Information	al Nata Na. 2. Daint plastar claspara abrasivas apresiva residuas ar other
contaminar	its may result in an undetermined alteration of wire and cable properties.
contaminar	an Note No. 3. Paint, plaster, cleaners, abrasives, corrosive residues, or other its may result in an undetermined alteration of wire and cable properties.
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#### Resolution: FR-7581-NFPA 70-2024

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(A) General.	
Circuits and equipment shall be installed in a <del>new manner</del> <u>skillful manner</u> . Cables installed exposed be supported by the building structure in such a normal building use. Such cables shall be securities listed and identified for securement and sup and installed so as not to damage the cable. Th 300.11. Plenum cable ties and other nonmetallic cables in other spaces used for environmental a and heat release properties in accordance with	eat <u>professional</u> and <del>workmanlike</del> ed on the surface of ceilings and sidewalls sha manner that the cable will not be damaged b red by hardware, including straps; staples: cal port; and hangers, or similar fittings, designer e installation shall also conform to 300.4 and c cable accessories used to secure and support air (plenums) shall be listed as having low smo 800.170.
Informational Note No. 1: See ANSI/BICS Telecommunications and IC Cabling and I E-2020, Commercial Building Telecommu 569-E-2019, Telecommunications Pathwa Residential Telecommunications Infrastructure Telecommunications Infrastructure Standa 2017, Healthcare Facility Telecommunications 2014, Telecommunications Infrastructure ANSI-approved installation standards for a	I N1-2019, Installation Practices for Related Cabling Infrastructure; ANSI/TIA-568. nications Infrastructure Standard; ANSI/TIA- ys and Spaces; ANSI/TIA-570-C-2012, cture Standard; ANSI/TIA-1005-A-2012, ard for Industrial Premises; ANSI/ TIA-1179-A- tions Infrastructure Standard; ANSI/TIA-4966- Standard for Educational Facilities; and other accepted industry practices.
Informational Note No. 2: See NFPA 90A-	0004 Oten developments lestelletien of Ain
<i>Conditioning and Ventilating Systems</i> , for accordance with 300.22(C).	discrete combustible components installed in
<i>Conditioning and Ventilating Systems</i> , for accordance with 300.22(C). Informational Note No. 3: Paint, plaster, cl contaminants may result in an undetermined	discrete combustible components installed in eaners, abrasives, corrosive residues, or othe ed alteration of wire and cable properties.
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Public Input No.	2017-NFPA 70-2023	[Section
<u>No. 760.24(A)]</u>		-

#### **Submitter Information Verification**

Submitter Full Name: Russ LeblancOrganization:Leblanc Consulting ServicesStreet Address:City:City:State:Zip:Fri Aug 11 06:41:12 EDT 2023Committee:NEC-P16

#### **Committee Statement**

Resolution: FR-7581-NFPA 70-2024

**Statement:** The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

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Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]
Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]
Public Input No. 26-NFPA 70-2023 [Section No. 800.170]
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]

## **Submitter Information Verification**

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Submittal Date:	Wed Jan 04 11:06:58 EST 2023
Committee:	NEC-P16

#### **Committee Statement**

#### Resolution: FR-7581-NFPA 70-2024

**Statement:** The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

Neat and workmanlike was changed to professional and skillful to correlate with 110.12.

The first sentence in 800.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Additional standards were added to Informational Note No. 1 to improve usability.

Section 800.24(A) was subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

Revise NFPA 90A reference

(A) General.	
Circuits and equ manner. Cables sidewalls shall b damaged by no staples: cable ti fittings, designe conform to 300. to secure and s listed as having	uipment shall be installed in a neat-proffesional and workmanlike skillful shall be permitted to be installed exposed on the surface of ceilings and be supported by the building structure in such a manner that the cable will not be rmal building use. Such cables shall be secured by hardware, including straps; es listed and identified for securement and support; and hangers, or similar d and installed so as not to damage the cable. The installation shall also 4 and 300.11. Plenum cable ties and other nonmetallic cable accessories used upport cables in other spaces used for environmental air (plenums) shall be low smoke and heat release properties in accordance with 800.170.
Information Telecomm E-2020, C 569-E-20 Residention Telecomm 2017, Hea 2014, Tele ANSI-app	onal Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for nunications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568.1- Commercial Building Telecommunications Infrastructure Standard; ANSI/TIA- 19, Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, al Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, nunications Infrastructure Standard for Industrial Premises; ANSI/ TIA-1179-A- althcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- ecommunications Infrastructure Standard for Educational Facilities; and other roved installation standards for accepted industry practices.
Informatic Condition accordance	onal Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air- ing and Ventilating Systems</i> , for discrete combustible components installed in ce with 300.22(C).
Informatic contamina	and Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other ants may result in an undetermined alteration of wire and cable properties.
Informatic contamina	anal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other ants may result in an undetermined alteration of wire and cable properties.
Informatic contamina atement of Prob Changed 'neat and consistency. Addin exposed. I searche exposed. bmitter Informa	<ul> <li>Inal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other ants may result in an undetermined alteration of wire and cable properties.</li> <li>Iem and Substantiation for Public Input</li> <li>workmanlike' to 'professional and skillful' matching the language in 110.12 for a language that clarifies to Code users that communication cables can be run d Chapter 8 in the NEC and nowhere it states communication cables can be rur</li> <li>tion Verification</li> </ul>
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Informatic contamina atement of Prob Changed 'neat and consistency. Addin exposed. I searche exposed. Ibmitter Informa Submitter Full Nar Organization: Street Address:	<ul> <li>Inal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other ants may result in an undetermined alteration of wire and cable properties.</li> <li>Iem and Substantiation for Public Input</li> <li>workmanlike' to 'professional and skillful' matching the language in 110.12 for ig language that clarifies to Code users that communication cables can be run id Chapter 8 in the NEC and nowhere it states communication cables can be run</li> <li>tion Verification</li> <li>me: Mike Holt</li> <li>Mike Holt Enterprises Inc</li> </ul>
Informatic contamina atement of Prob Changed 'neat and consistency. Addin exposed. I searche exposed. Ibmitter Informa Submitter Full Nar Organization: Street Address: City: State:	<ul> <li>Inal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other ants may result in an undetermined alteration of wire and cable properties.</li> <li>Iem and Substantiation for Public Input</li> <li>workmanlike' to 'professional and skillful' matching the language in 110.12 for ig language that clarifies to Code users that communication cables can be run id Chapter 8 in the NEC and nowhere it states communication cables can be run</li> <li>tion Verification</li> <li>me: Mike Holt</li> <li>Mike Holt Enterprises Inc</li> </ul>
Informatic contamina atement of Prob Changed 'neat and consistency. Addin exposed. I searche exposed. Ibmitter Informa Submitter Full Nat Organization: Street Address: City: State: Zip:	<ul> <li>anal Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other ants may result in an undetermined alteration of wire and cable properties.</li> <li>Iem and Substantiation for Public Input</li> <li>workmanlike' to 'professional and skillful' matching the language in 110.12 for 19 language that clarifies to Code users that communication cables can be run d Chapter 8 in the NEC and nowhere it states communication cables can be run</li> <li>tion Verification</li> <li>me: Mike Holt</li> <li>Mike Holt Enterprises Inc</li> </ul>

Statement: The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

Neat and workmanlike was changed to professional and skillful to correlate with 110.12.

The first sentence in 800.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Additional standards were added to Informational Note No. 1 to improve usability.

Public Input N	o. 2446-NFPA 70-2023 [ Section No. 800.24(A) ]
(A) General.	
Circuits and equi	pment shall be installed in a neat and workmanlike manner.
(1) Supporting.	
Cables installed of building structure	exposed on the surface of ceilings and sidewalls shall be supported by the in such a manner that the cable will not be damaged by normal building use.
(2) Securing.	
Such cables shal identified for secu as not to damage	l be secured by hardware, including straps; staples: cable ties listed and urement and support; and hangers, or similar fittings, designed and installed so a the cable. The installation shall also conform to 300.4 and 300.11.
<u>(3)</u> Plenum <u>Rate</u>	<u>d.</u>
<u>Plenum</u> cable tie in other spaces u heat release prop	is and other nonmetallic cable accessories used to secure and support cables sed for environmental air (plenums) shall be listed as having low smoke and perties in accordance with 800.170.
Telecommu E-2020, Co 569-E-2019 Residential Telecommu 2017, Heal 2014, Teleo ANSI-appro	al Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for unications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568.1- ommercial Building Telecommunications Infrastructure Standard; ANSI/TIA- 9, Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, unications Infrastructure Standard for Industrial Premises; ANSI/TIA-1179-A- thcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- communications Infrastructure Standard for Educational Facilities; and other byed installation standards for accepted industry practices.
Information Conditionin accordance	al Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air- g and Ventilating Systems</i> , for discrete combustible components installed in with 300.22(C).
Information contaminar	al Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other nts may result in an undetermined alteration of wire and cable properties.
tatement of Proble	em and Substantiation for Public Input
Breaking first level s with NEC Style Man avoided. Additional s	ubdivision into a list item format to provide clarity for Code users. In accordance ual section 3.5.1.2 multiple requirements within a single subdivision shall be subdivisions or lists shall be used to express independent requirements.
ubmitter Informati	on Verification
Submitter Full Nam	e: Mike Holt
Organization: Street Address: City: State: Zip:	Mike Holt Enterprises Inc
Submittal Date: Committee:	Thu Aug 17 12:18:55 EDT 2023 NEC-P16

Committee St	atement
<b>Resolution:</b>	FR-7581-NFPA 70-2024
Statement:	The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.
	Neat and workmanlike was changed to professional and skillful to correlate with 110.12.
	The first sentence in 800.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.
	Additional standards were added to Informational Note No. 1 to improve usability.
	Section 800.24(A) was subdivided to comply with section 3.5.1.2 of the NEC Style Manual.

# Public Input No. 2495-NFPA 70-2023 [ Section No. 800.24(A) ] (A) General. Circuits and equipment shall be installed in a neat-professional and workmanlike skillful 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 listed and identified for securement and support; and hangers, or similar fittings, designed and installed so as not to damage the cable. The installation shall also conform to 300.4 and 300.11. Plenum 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. Informational Note No. 1: See ANSI/BICSI N1-2019. Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568.1-E-2020, Commercial Building Telecommunications Infrastructure Standard; ANSI/TIA-569-E-2019, 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-A-2017, Healthcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966-2014, Telecommunications Infrastructure Standard for Educational Facilities; and other ANSI-approved installation standards for accepted industry practices. Informational Note No. 2: See NFPA 90A-2021, 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. Statement of Problem and Substantiation for Public Input Changing the wording matches what is in 110.12. Keeping the wording the same promotes consistency throughout the code. Additional inputs will be done for other code articles. 722.24, 724.24, 725.24 726.24, 760.24(A), 770.24(A). Related Public Inputs for This Document **Related Input** Relationship Public Input No. 2486-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 2488-NFPA 70-2023 [Section No. 724.24] Public Input No. 2491-NFPA 70-2023 [Section No. 725.24] Public Input No. 2492-NFPA 70-2023 [Section No. 726.24] Public Input No. 2493-NFPA 70-2023 [Section No. 760.24(A)] Public Input No. 2494-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 2486-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 2488-NFPA 70-2023 [Section No. 724.24] Public Input No. 2491-NFPA 70-2023 [Section No. 725.24] Public Input No. 2492-NFPA 70-2023 [Section No. 726.24] Public Input No. 2493-NFPA 70-2023 [Section No. 760.24(A)] Public Input No. 2494-NFPA 70-2023 [Section No. 770.24(A)]

#### **Submitter Information Verification**

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Submittal Date:	Fri Aug 18 12:32:47 EDT 2023
Committee:	NEC-P16

## **Committee Statement**

Resolution: FR-7581-NFPA 70-2024

**Statement:** The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

Neat and workmanlike was changed to professional and skillful to correlate with 110.12.

The first sentence in 800.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Additional standards were added to Informational Note No. 1 to improve usability.

(A) General.			
Circuits and equences of the such a manner to secured by hard and support; and cable. The instate nonmetallic cable environmental a accordance with	ipment shall be installed in a neat an surface of ceilings and sidewalls sha hat the cable will not be damaged by ware, including straps; staples: cable d hangers, or similar fittings, designer lation shall also conform to 300.4 ar le accessories used to secure and su ir (plenums) shall be listed as having to 800.170 -	d workmanlike manner. Cables II be supported by the building of normal building use. Such cab ities listed and identified for se d and installed so as not to dan nd 300.11 . Plenum cable ties a pport cables in other spaces us low smoke and heat release p	installed structure in oles shall be curement nage the and other sed for roperties in
Informatio <del>Telecomm</del> <del>568.1- E-2</del> <del>ANSI/TIA-</del> <del>2012, Re:</del> <del>Telecomm</del> <del>2017, Hei</del> <del>2014, Tele</del> <del>ANSI-appi</del> Information <del>Conditioni</del> <del>accordance</del>	nal Note No. 1: See ANSI/BICSI N1- vunications and IC Cabling and Relate 2020, Commercial Building Telecomm 569-E-2019, Telecommunications Infrastre- sidential Telecommunications Infrastre- vunications Infrastructure Standard for althcare Facility Telecommunications ecommunications Infrastructure Standard roved installation standards for accep nal Note No. 2: See NFPA 90A-2021 ing and Ventilating Systems, for discu- ce with 300.22(C).	2019, Installation Practices for ad Cabling Infrastructure ; ANS nunications Infrastructure Stand athways and Spaces; ANSI/TIA ucture Standard; ANSI/TIA-100 r Industrial Premises; ANSI/TIA Infrastructure Standard; ANSI/ Infrastructure Standard; ANSI/ dard for Educational Facilities; oted industry practices. - Standard for the Installation of rete combustible components in	- <del>I/TIA-</del> <del>dard;</del> <del>\-570-C- 05-A-2012, A-1179-A- TIA-4966- and other and other of Air- nstalled in</del>
Informatio contamina	nal Note No. 3: Paint, plaster, cleane Ints may result in an undetermined al	rs, abrasives, corrosive residue teration of wire and cable prope	<del>es, or other</del> e <del>rties.</del>
Additional Propose	ed Changes		
Limited_Energy_T	File Name G_First_Draft_Substantiation.docx	Description First Draft Substantiation	<u>Approved</u>
Statement of Prob	em and Substantiation for Pr	ublic Input	
This text is being de relocated as a gene Submitter Informat	eleted as part of the reorganization of aral requirement to new Article X00. tion Verification	<sup>t</sup> the limited energy articles. The	e deleted text
	er er Manula I III. aut		
Submitter Full Nar Organization: Street Address: City: State:	ne: Mark Hilbert MR Hilbert Insp. & Training		

## **Committee Statement**

**Resolution:** A considerable part of the text from Article 800 Section 24 is not relocated but deleted from the referenced new Article X00 under PI-3234. There is no technical justification supplied for the deletion of these requirements. The relocated text in the proposed X00 does not address the proposed revisions of PI-3694, PI-1709, PI-1184, PI-1386, PI-2013, PI-22, PI-2444, PI-2446, PI-2495, PI-4045, and PI-51 with concerns updates, word changes and deletions to the text. Without including such revisions will result in conflicts and confusion between the new X00 Article and possible First Draft actions on these PIs.

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



(A) General.	
Circuits and equi exposed on the s such a manner th secured by hards and support; and cable. The instal nonmetallic cable environmental ai accordance with	pment shall be installed in a neat and workmanlike manner. Cables installed surface of ceilings and sidewalls shall be supported by the building structure in nat the cable will not be damaged by normal building use. Such cables shall b ware, including straps; staples: cable ties listed and identified for securement I hangers, or similar fittings, designed and installed so as not to damage the lation shall also conform to 300.4 and 300.11. Plenum cable ties and other e accessories used to secure and support cables in other spaces used for r (plenums) shall be listed as having low smoke and heat release properties in 800.170.
Information Telecommu 568.1- E-2 ANSI/TIA-5 2012, Resi Telecommu 2017, Hea 2014, Tele ANSI-appr	nal Note No. 1: See ANSI/BICSI N1 <del>-2019</del> , Installation Practices for unications and <del>IC</del> <u>ICT</u> Cabling and Related Cabling Infrastructure; ANSI/TIA- 020, Commercial Building Telecommunications Infrastructure Standard; 569-E-2019, Telecommunications Pathways and Spaces; ANSI/TIA-570-C- idential Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, unications Infrastructure Standard for Industrial Premises; ANSI/TIA-1179-A- Ithcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- communications Infrastructure Standard for Educational Facilities; and other oved installation standards for accepted industry practices.
Informatior <i>Conditionir</i> accordanc	nal Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air- ng and Ventilating Systems</i> , for discrete combustible components installed in e with 300.22(C).
	al Nata Na 2) Daint plastar algonary abrasivas apresiva residuas ar etho
Informatior contamina	nts may result in an undetermined alteration of wire and cable properties.
Informatior contaminal	an Note No. 3. Paint, plaster, cleaners, abrasives, consideresidues, or other nts may result in an undetermined alteration of wire and cable properties.
Information contaminal tement of Proble The edition dat the 2023 NEC states as the latest edition Corrects the titl bmitter Informat	e for ANSI/BICSI N1 has been deleted because it is not needed. Section 90.5 s "Unless the standard reference includes a date, the reference is to be considered of the standard."
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Informatior contaminal atement of Proble • The edition dat the 2023 NEC states as the latest edition • Corrects the titl bmitter Informati Submitter Full Nam Organization: Street Address: City: State: Zip:	e for ANSI/BICSI N1 has been deleted because it is not needed. Section 90.5 s "Unless the standard reference includes a date, the reference is to be considered to the standard." le of the standard. ion Verification

Resolution: FR-7581-NFPA 70-2024

Statement: The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

Neat and workmanlike was changed to professional and skillful to correlate with 110.12.

The first sentence in 800.24(A) has been deleted since "neat and workmanlike" is unenforceable. Additionally, the recommended language of professional and skillful is also unenforceable and ambiguous and has not been adopted.

Additional standards were added to Informational Note No. 1 to improve usability.

Circuits and equip <u>skillful manner</u> . C	ment shall be installed in a <del>next and workmanlike manner</del> professional and
supported by the normal building us ties listed and ide and installed so a 300.11. Plenum c cables in other sp and heat release	Cables installed exposed on the surface of ceilings and sidewalls shall be building structure in such a manner that the cable will not be damaged by se. Such cables shall be secured by hardware, including straps; staples: cable ntified for securement and support; and hangers, or similar fittings, designed is not to damage the cable. The installation shall also conform to 300.4 and able ties and other nonmetallic cable accessories used to secure and support baces used for environmental air (plenums) shall be listed as having low smoke properties in accordance with 800.170.
Informationa Telecommu E-2020, Co 569-E-2019 Residential Telecommu 2017, Healt 2014, Telec ANSI-appro	al Note No. 1: See ANSI/BICSI N1-2019, Installation Practices for inications and IC Cabling and Related Cabling Infrastructure; ANSI/TIA-568.1- mmercial Building Telecommunications Infrastructure Standard; ANSI/TIA- 0, Telecommunications Pathways and Spaces; ANSI/TIA-570-C-2012, Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, inications Infrastructure Standard for Industrial Premises; ANSI/ TIA-1179-A- thcare Facility Telecommunications Infrastructure Standard; ANSI/TIA-4966- communications Infrastructure Standard for Educational Facilities; and other by ed installation standards for accepted industry practices.
Information <i>Conditioning</i> accordance	al Note No. 2: See NFPA 90A-2021, <i>Standard for the Installation of Air- g and Ventilating Systems</i> , for discrete combustible components installed in with 300.22(C).
Information contaminan	al Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other its may result in an undetermined alteration of wire and cable properties.
atement of Proble The requirements of	am and Substantiation for Public Input this section do not correlate with 110.12. Further, the requirements in this secti
do not comply with the were vague and une	ie NEC Style Manual whereby it was determined that "neat" and "workmanlike" nforceable and were therefore changed to "professional" and "skillful" in 110.12
bmitter Informati	on Verification
Cubmitter Full Nem	er Delmen Hielmen
Organization:	Electrical Training Alliance
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Fri Jan 06 11:39:44 EST 2023
	NEC-P16
Committee:	
Committee:	nt

Statement: The issue dates of NFPA 90A and ANSI/BICSI N1 were updated to align with the NFPA manual of style. The section in NFPA 90A dealing with discrete products was added to improve usability.

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Additional standards were added to Informational Note No. 1 to improve usability.

Public Input N	o. 700-NFPA 70-2023 [ Section No. 800.24(B) ]
(B) Circuit Integ	rity (CI) Cable.
CI cable shall be Cable shall be se and fasteners sha	supported at <del>a distance not exceeding-</del> 610 mm (24 in.) <u>maximum intervals</u> . cured to the noncombustible surface of the building structure. Cable supports all be steel.
Statement of Proble	em and Substantiation for Public Input
Shall be supported a securing and suppor length?	at a distancefrom what? And what happens after that? Am I finished with the ting requirements? Do I really only need to secure it once, regardless of cable
Submitter Informati	on Verification
Submitter Full Nam	e: Ryan Jackson
Organization:	Self-employed
Street Address:	
City:	
State:	
ZIP: Submittal Data:	Thu Apr 20 16:02:48 EDT 2023
Committee	NEC-P16
Committee Stateme	ent
Resolution: FR-758	83-NFPA 70-2024
Statement: Section	n 800.24(B) was revised to improve clarity.

Continue 000			
Sections Sur	J.25, 800.26		
The accessible future use wit	le portion of abandoned cables shall be h a tag, the tag shall be of sufficient du	removed. Where cables are id- rability to withstand the environ	<del>entified for</del> <del>ment</del>
800.26 Spre	ad of Fire or Products of Combustion.		
Installations c vertical shafts fire or product of cables, cor walls, partition fire resistance	of cables, communications raceways, ca b, and ventilation or air-handling ducts s ts of combustion will not be substantial nmunications raceways, and cable rout ns, floors, or ceilings shall be firestoppe b rating.	able routing assemblies in hollo hall be made so that the possib y increased. Openings around p ing assemblies through fire-resi ed using approved methods to n	w spaces, vle spread of penetrations istant-rated naintain the
Informa testing I fire-resi codes a resistan separat Assistar	tional Note: Directories of electrical co aboratories contain many listing installa stive rating of assemblies where penet ilso contain restrictions on membrane p ice–rated wall assembly. An example is ion that usually applies between boxes nce in complying with 800.26 can be fo	nstruction materials published b ation restrictions necessary to n rations or openings are made. E penetrations on opposite sides of the 600 mm (24 in.) minimum f installed on opposite sides of the pund in building codes, fire resident	ny qualified maintain the Building of a fire morizontal morizontal
director	ies, and product listings.		stance
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**Resolution:** For clarity, ease-of-use, and avoiding confusion it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X00 does not address the proposed revisions of PI-700 with textual changes.

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block


800.26 Spread	of Fire or Products of Combustion.
Installations of c spaces, vertical spread of fire or penetrations of c resistant-rated w to maintain the f	ables, communications raceways, <u>and</u> cable routing assemblies in hollow shafts, and ventilation or air-handling ducts shall be made so that the possible products of combustion will not be substantially increased. Openings around cables, communications raceways, and cable routing assemblies through fire- valls, partitions, floors, or ceilings shall be firestopped using approved methods ire resistance rating.
Information testing lab fire-resistiv codes also resistance separation	hal Note: Directories of electrical construction materials published by qualified oratories contain many listing installation restrictions necessary to maintain the ve rating of assemblies where penetrations or openings are made. Building o contain restrictions on membrane penetrations on opposite sides of a fire –rated wall assembly. An example is the 600 mm (24 in.) minimum horizontal that usually applies between boxes installed on opposite sides of the wall.
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800.26 Spread	of Fire or Products of Combustion.
Installations of ca vertical shafts, a fire or products of of cables, comm walls, partitions, fire resistance re	ables, communications raceways, cable routing assemblies in hollow spaces, nd ventilation or air-handling ducts shall be made so that the possible spread of of combustion will not be substantially increased. Openings around penetrations runications raceways, and cable routing assemblies through fire-resistant-rated floors, or ceilings shall be firestopped using approved methods to maintain the ating.
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#### Statement of Problem and Substantiation for Public Input

This public input is a follow up to work performed in the 2023 code cycle by a Task Group chartered by the chair of the NEC AAC to consider correlation issues between chapters 7 and 8. The work is being resubmitted to align with limited energy reorganization recommendations made in this code cycle through new correlating committee Task Groups.

By identifying the communications service point, analogous to the electrical service point, the domain of the communications circuits in chapter 8 become more clearly inspectable. The definition of communications circuit in chapter 8 extends service from the communications utility or service provider, which this definition would do. In civilian telecommunications, outside plant refers to all of the physical cabling and supporting infrastructure (such as conduit, cabinets, tower or poles), and any associated hardware (such as repeaters) located between a demarcation point in a switching facility and a demarcation point in another switching center or customer premises. The term "outside plant communications cable" is also used in 805.48 to distinguish cable coming from the service provider. The 50 feet references the outside plant cable entry to the premises in 770.48 and 805.48. The reference to extension of communications point references 770.48(B) and 805.48, where extension in conduit is described. The portion of this infrastructure contained within a building is the inside plant, and the portion of this infrastructure connecting buildings or facilities is the outside plant. Where these two plants meet in a given structure is the Communications service point. The distance of 50 feet permits an unlisted Outside Plant (OSP) cable to enter a building (single family home, apartment block, or commercial building) and to reach a practical transition point to the premises wiring in a cable vault. telecom closet/room, cross connect frame or cabinet, in the vicinity of the main grounding means for the building. It is desirable for this OSP segment be as short as practical. Service drop service communications cables that are Listed are permitted to extend further than 50 feet. The distance of 48 inches is derived from the recommended horizontal separation for equipment boxes on opposite sides of wall, including separation requirements from gas, communications, and power, as well as considerations of providing sufficient working space around equipment closure and for stress-relaxation and drip loops of cables. (see 800.26 IFN - "... An example is the 600 mm (24 in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall.....)

#### **Related Public Inputs for This Document**

**Relationship** 

related definition

Public Input No. 3336-NFPA 70-2023 [New Definition after Definition: Communications Equipment.]

**Related Input** 

#### **Submitter Information Verification**

Submitter Full Name: George ZimmermanOrganization:CME Consulting, Inc.Affiliation:(self)Street Address:City:City:State:Zip:Fri Sep 01 13:07:21 EDT 2023Submittal Date:NEC-P16

#### **Committee Statement**

**Resolution:** The action taken on 800.48 adds two informational notes to 800.48 to clarify that the protector (for multipair communications cable) and the grounding block (for CATV installations) are typically communications service points. The substantiation provided in the proposed revision does not include a sufficient technical reason or identify a need for enhanced safety regarding communication service points. The concerns raised in this proposed new section have been addressed in the actions taken on 800.48.

800.44 Overhea	d (Aerial) Wires and Cables.
Overhead (aeria coaxial cables e	l) communications wires and cables <u>, optical fiber cables,</u> and CATV-type ntering buildings shall comply with 800.44(A) through (D).
Information <del>Code</del> <u>Safe</u> additional	nal Note: See <del>ANSI-</del> C2- <del>2017</del> <u>2023</u> , <i>National Electrical <del>Safety</del> <u>ty_Code®(NESC®)</u> , <i>Part 2 Safety Rules for Overhead Lines</i>, for information regarding overhead (aerial) wires and cables.</i>
(A) On Poles, Ir	I-Span, Above Roofs, on Masts, or Between Buildings.
If communication electric light or p other in-span, th	ns wires and cables <u>, optical fiber cables,</u> or CATV-type coaxial cables and ower conductors are supported by the same pole or are run parallel to each e conditions described in 800.44(A)(1) through (A)(4) shall be met.
(1) Relative Loc	ation.
If practicable, the coaxial cables sh	communications wires and cables <u>, optical fiber cables,</u> and CATV- type all be located below the electric light or power conductors.
(2) Attachment	o Cross-Arms.
Communications be attached to a	wires and cables, <u>optical fiber cables</u> , and CATV-type coaxial cables shall ne cross-arm that carries electric light or power conductors.
(3)- Climbing Sp	r <del>ace _ Spacing</del> .
The climbing <del>spa</del> 225.14(B).	<del>ce-</del> <u>spacing</u> through wires and cables shall comply with the requirements of
(4) Clearance.	
Supply service d above and parall coaxial service d span, including th conductors are in between the two	rops and sets of overhead service conductors of 0 volts to 750 volts running el to communications wires and cables, <u>optical fiber cables</u> , and CATV-type rops shall have a minimum separation of 300 mm (12 in.) at any point in the ne point of their attachment to the building, provided that the ungrounded isulated and that a clearance of not less than 1.0 m (40 in.) is maintained services at the pole.
(B) Above Roof	S.
Communications have a vertical cl pass.	wires and cables, <u>optical fiber cables</u> , and CATV-type coaxial cables shall earance of not less than 2.5 m (8 ft) from all points of roofs above which they
Exception No. 1 coaxial cables s above auxiliary	: Communications wires and cables <u>, optical fiber cables,</u> and CATV-type hall not be required to have a vertical clearance of not less than 2.5 m (8 ft) buildings, such as garages and the like.
Exception No. 2 not less than 45 communications overhang and (2 support.	A reduction in clearance above only the overhanging portion of the roof to 0 mm (18 in.) shall be permitted if (1) not more than 1.2 m (4 ft) of <u>s, optical fiber</u> , and CATV-type service-drop conductors pass above the roof they are terminated at a through- or above-the-roof raceway or approved
Exception No. 3 12 in.), a reduct	:- <del>Where <u>If</u> the roof has a slope of not less than 100 mm in 300 mm (4 in. in ion in clearance to not less than 900 mm (3 ft) shall be permitted.</del>
Information	al Note: See <del>ANSI/IEEE</del> C2- <del>2017</del> <u>2023</u> , <i>National Electrical Safety- <del>Code</del></i> IESC®) Part 2. Safety Rules for Overhead Lines, for additional information

regarding overhead (aerial) wire and cables.

#### (C) On Masts.

Overhead (aerial) communications wires and cables, <u>conductive optical fiber cables</u>, and CATV-type 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. <u>Nonconductive optical fiber cables shall be permitted to be attached to an above-the -roof mast that encloses or supports conductors of electric light or power circuits.</u>

#### (D) Between Buildings.

Communications <u>cables</u>, <u>optical fiber cables</u> and CATV-type 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: If a communications cable,\_ or <u>optical fiber cable, or</u> a CATV-type 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, communications wires and cables, <u>optical fiber cables</u>, and CATV-type coaxial cables shall be securely fastened in such a manner that they will be separated from other conductors in accordance with 800.44(E)(1) and (E)(2).

(1) Electric Light or Power.

The communications wires and cables, <u>conductive optical fiber cables</u>, and CATV-type coaxial cables 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 nonconductive barrier in addition to the insulation on the wires.

(2) Other Communications Systems.

Communications wires and cables, <u>optical fiber cables</u>, and CATV-type coaxial cables shall be installed so that there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the wires, cables, messenger strand, or equipment of one system cause abrasion to the wires, cables, messenger strand, or equipment of any other system.

#### Statement of Problem and Substantiation for Public Input

Multiple PIs have been submitted to include optical fiber cables in Article 800 when they are used for communications, thereby increasing the usability of Article 800.

The references to the National Electrical Safety Code have been updated.

#### **Submitter Information Verification**

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Submittal Date:	Thu Jun 22 13:24:11 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

# Resolution: FR-7665-NFPA 70-2024 Statement: This revision is one of many that complete the inclusion of optical fiber cable in Article 800 that was started two codes cycles ago. In order to provide consistent terminology throughout the section, the term "supply service drops" was changed to "electric light or power conductors". "Electric light or power conductors" is the term used in the lead in sentence for 800.44.

(4) Clearance.	
Supply service of running above a drops shall have including the poi are insulated an services at the p	<u>Service</u> drops and <del>sets of</del> overhead service conductors of 0 volts to 750 volts and parallel to communications wires and cables and CATV-type coaxial service a minimum separation of 300 mm (12 in.) at <del>any point</del> <u>all points</u> in the span, int of their attachment to the building <del>, provided that the ungrounded conductors</del> ad that a clearance of not less than 1 .0 m (40 in.) is maintained between the two pole.
atement of Probl	lem and Substantiation for Public Input
constructed, this se power conductors a insulated, and there	entence appears to only apply if the clearance at the pole is at least 40" and if the are insulated. Which means there is NO clearance if the conductors are not is no clearance if there is less than 40 " seperation at the pole. If the intent of the the 40" approximation than the rules peads to be rewritten.
intent truly is, so I'm 16. bmitter Informat	a fraid I have no suggestion on how to fix it other than to simply point it out to C
bmitter Informat	tion Verification
bmitter Informat Submitter Full Nan Organization:	tion Verification ne: Ryan Jackson Self-employed
section is to require intent truly is, so I'm 16. bmitter Informat Submitter Full Nan Organization: Street Address:	tion Verification ne: Ryan Jackson Self-employed
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Submitter Informat Submitter Informat Submitter Full Nan Organization: Street Address: City: State: Zip: Submittal Date: Committee:	Fri Aug 18 12:19:44 EDT 2023 NEC-P16
section is to require intent truly is, so I'm 16. bmitter Informat Submitter Full Nan Organization: Street Address: City: State: Zip: Submittal Date: Committee Stateme	tion Verification me: Ryan Jackson Self-employed Fri Aug 18 12:19:44 EDT 2023 NEC-P16 ent

## Public Input No. 416-NFPA 70-2023 [ Section No. 800.44(A)(4) ]

#### (4) Clearance.

Supply service drops <u>utility drops</u> and sets of overhead service conductors of 0 volts to 750 volts running above and parallel to communications wires and cables and CATV-type coaxial service drops <u>utility drops</u> shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of 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.

#### **Statement of Problem and Substantiation for Public Input**

This PI is associated with several other PIs to recommend a global change from "service drop" to "utility drop" and from "service lateral" to "utility lateral." "Service drop" appears 23 times in the Code and "service lateral" appears 15 times. There are 11 definitions that begin with the word 'service.' Of these, 9 are customer owned and only "service drop" and "service lateral" are utility owned and, therefore, outside the scope of the Code. "service drops" and "service laterals" are not service conductors as they do not fit the definition. Confining the word "service" to only those items that are customer owned would clear up much confusion on this topic. Appendix A shows UL 523 as having the title "telephone service drop wire" and the UL standard does, in fact, have that title. However, the text of UL 523 defines this wire as customer owned and Article 805 refers to this wire as a "drop wire."

#### **Related Public Inputs for This Document**

#### Related Input

Public Input No. 411-NFPA 70-2023 [Section No. 90.2(D)]

Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]

Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]

Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po...]

Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]

Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]

Public Input No. 418-NFPA 70-2023 [Section No. 701.12(F)]

Public Input No. 419-NFPA 70-2023 [Section No. 770.44(A)(4)]

Public Input No. 420-NFPA 70-2023 [Section No. 770.44(B)]

Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]

Public Input No. 422-NFPA 70-2023 [Section No. 230.40]

Public Input No. 423-NFPA 70-2023 [Section No.

#### **Relationship**

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral' Global change from 'service drop' to 'utility

250.24	4(A)(1)]

Public Input No. 424-NFPA 70-2023 [Section No. 250.24(F)]

Public Input No. 425-NFPA 70-2023 [Section No. 250.64(D)(1)]

Public Input No. 426-NFPA 70-2023 [Section No. 250.66 [Excluding any Sub-Sections]]

Public Input No. 411-NFPA 70-2023 [Section No. 90.2(D)]

Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]

Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]

Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po...]

Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]

Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]

Public Input No. 418-NFPA 70-2023 [Section No. 701.12(F)]

Public Input No. 419-NFPA 70-2023 [Section No. 770.44(A)(4)]

Public Input No. 420-NFPA 70-2023 [Section No. 770.44(B)]

Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]

Public Input No. 422-NFPA 70-2023 [Section No. 230.40]

Public Input No. 423-NFPA 70-2023 [Section No. 250.24(A)(1)]

Public Input No. 424-NFPA 70-2023 [Section No. 250.24(F)]

Public Input No. 425-NFPA 70-2023 [Section No. 250.64(D)(1)]

Public Input No. 426-NFPA 70-2023 [Section No. 250.66 [Excluding any Sub-Sections]]

#### **Submitter Information Verification**

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Submittal Date:	Sat Mar 04 16:35:21 EST 2023
Committee:	NEC-P16

drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

Global change from 'service drop' to 'utility drop' and 'service lateral' to 'utility lateral'

#### **Committee Statement**

**Resolution:** This revision has not been adopted since the action taken on 800.44(A)(4) does not use the term "Supply service drop."

Public Input No. 1	186-NFPA 70-2023 [ Section No. 800.47 ]
800.47 Underground	Systems Entering Buildings.
Underground commu cables, and network- comply with 800.47(A	nications wires and cables, <u>optical fiber cables</u> , CATV-type coaxial powered broadband communications cables entering buildings shall ) and (B) The requirements of 310.10(C) shall not apply to s and cables and CATV-type coaxial cables.
(A) Underground Sys Alarm Circuit Conduct	stems with Electric Light, Power, Class 1, or Non-Power-Limited Fire stors.
Underground commun coaxial cables, and ne pedestal, handhole er power-limited fire alar by means of brick, co	nications wires and cables, <u>conductive optical fiber cables</u> , CATV-type etwork-powered broadband communications cables in a raceway, nclosure, or manhole containing electric light, power, Class 1, or non- m circuit conductors shall be in a section separated from such conductors ncrete, or tile partitions or by means of a suitable barrier.
(B) Direct-Buried Ca	bles and Raceways.
Direct-buried commur coaxial cables, and ne least 300 mm (12 in.) conductors, or Class	nications wires and cables, <u>conductive optical fiber cables</u> , CATV-type etwork-powered broadband communications cables shall be separated at from conductors of any light or power, non-power-limited fire alarm circuit 1 circuit.
Exception No. 1: Sep direct-buried commu coaxial cables, and r raceways or have me	paration shall not be required if electric service conductors or all the nications wires and cables, <u>conductive optical fiber cables,</u> CATV-type network-powered broadband communications cables are installed in etal cable armor.
Exception No. 2: Sep	paration shall not be required under one of the following conditions:
(1) If the electric lig conductors are i Type USE cable	ht or power branch-circuit or feeder conductors or Class 1 circuit nstalled in a raceway or in metal-sheathed, metal-clad, or Type UF or s
(2) If all the direct-k network-powere installed in race	ouried communications wires cables, CATV-type coaxial cables, and d broadband communications cables have metal cable armor or are way
tatement of Problem a	and Substantiation for Public Input
Multiple PIs have been so communications, thereby	ubmitted to include optical fiber cables in Article 800 when they are used for increasing the usability of Article 800.
The reference to 310.10( has been deleted.	C) was deleted because it refers to text in an earlier edition of the Code the
ubmitter Information	Verification
Submitter Full Name: Le	eslie Jutte
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Submittal Date:	Thu Jun 22 13:41:00 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: FR-7674-NFPA 70-2024

**Statement:** This revision is one of many that complete the inclusion of optical fiber cable in Article 800. The reference to 310.10(C) has not been deleted since it is a current section in the code.

80	<b>10.48</b> Unlisted Cables Entering Buildings.
Ur ca ins en	listed outside plant communications cables- <del>and</del> ,_ unlisted outside plant CATV-type coaxia bles <u>and unlisted conductive and nonconductive optical fiber cables,</u> shall be permitted to b stalled in building spaces other than risers, ducts used for environmental air, plenums used vironmental air, and other spaces used for environmental air if all of the following applies:
(1)	The length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft).
(2)	The cable enters the building from the outside.
(3)	The unlisted outside plant communications cable is terminated in an enclosure or on a listed primary protector <del>, or the <u>.</u></del>
(4)	<u>The</u> unlisted outside plant CATV type coaxial cable is terminated at a grounding block.
(5)	The unlisted conductive or nonconductive optical fiber cable is terminated in and enclosure.
<u>Th</u> <u>pla</u> <u>op</u> roc int	<u>e</u> point of entrance <u>of the unlisted outside plant communications cables, unlisted outside</u> <u>ant CATV-type coaxial cables, and unlisted outside plant conductive and nonconductive</u> <u>tical fiber cables</u> , shall be permitted to be extended from the penetration of the external way of, or floor slab by continuously enclosing the entrance cables in rigid metal conduit (RMC) ermediate metal conduit (IMC) to the point of emergence.
Th	e point of entrance of unlisted nonconductive optical fiber cables shall be permitted to be
ex	tended from the penetration of the external wall, roof, or floor slab by continuously enclosin
the	ecables in rigid polyvinyl chloride conduit (PVC), or electrical metallic tubing (EMT), in space
oth	ner than risers, ducts used for environmental air, plenums used for environmental air, and
<u>oth</u>	ner spaces used for environmental air.
	Informational Note No. 1: Splice cases or terminal boxes, both metallic and plastic type are typically used as enclosures for splicing or terminating communications cables <u>and optical fiber cables</u> .
	Informational Note No. 2: This section limits the length of unlisted outside plant <u>communications</u> cable to 15 m (50 ft) from the point of entrance, while 805.90(B) requires that the primary protector be located as close as practicable to the point of entrance of the cable. Therefore, in installations requiring a primary protector, the outside plant <u>communications</u> cable may not extend 15 m (50 ft) into the building if it is practicable to primary protector protector and the primary protector be plant <u>communications</u> cable may not extend 15 m (50 ft) into the building if it is

800.48 already covers the installation requirements for unlisted outside plant communications cables and unlisted outside plant CATV-type coaxial cables. The text of his Public Comment enhances usability by bringing into 800.48 the requirements for installing unlisted outside plant optical fiber cables, thereby having the installation requirements for all unlisted entrance cables in one section. The recommended text requirements for optical fiber cables correlate with 770.48. The word "communications" was added to Informational Note No. 2 for clarity, since that Informational Note only applies to communications cables.

#### **Related Public Inputs for This Document**

 Related Input

 Public Input No. 2561-NFPA 70-2023 [Section No. 770.48]

 Public Input No. 2561-NFPA 70-2023 [Section No. 770.48]

Relationship Deletes 770.48

#### **Submitter Information Verification**

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Submittal Date:	Mon Jun 19 15:19:25 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: FR-7678-NFPA 70-2024

**Statement:** There are only three types of unlisted outside plant cables used as entrance cables in communications installations, communications cables, CATV-type coaxial cables, and optical fiber cables. Section 800.48 already covers the installation requirements for unlisted outside plant communications cables and unlisted outside plant CATV-type coaxial cables. This revision enhances usability by bringing into 800.48 the requirements for installing unlisted outside plant optical fiber cables, thereby having the installation requirements for all unlisted entrance cables in one section. The recommended text requirements for optical fiber cables correlate with 770.48. The word "communications" was added to Informational Note No. 2 for clarity, since that Informational Note only applies to communications cables.

The text has been revised to clarify that "continuously enclosing" a cable in a raceway is "without the use of pull or junction boxes".

Informational notes 3 and 4 have been added to 800.48 to clarify that the protector (for multipair communications cable) and the grounding block (for CATV installations) are typically communications service points.



#### **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block





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

Installations of communications cables and entering the building or terminating on the outside of the building shall comply with 800.93(A) or (B).

800.93(A) Entering Buildings. In installations where the communications cable or conductive optical fiber cable enters a building, the metallic sheath members of the cable shall be 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.

800.93(B) Terminating on the Outside of Buildings. In installations where the communications cable or conductive optical fiber cable is terminated on the outside of the building, the metallic sheath members of the cable shall be 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.

#### Statement of Problem and Substantiation for Public Input

This new section 800.93 combines 770.93 and 805.93 in the general article thereby improving usability.

#### **Related Public Inputs for This Document**

#### Related Input

Public Input No. 1188-NFPA 70-2023 [Section No. 805.93] Public Input No. 1188-NFPA 70-2023 [Section No. 805.93]

#### **Submitter Information Verification**

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### Relationship

Deletes requirements from Article 805

Submittal Date:	Thu Jun 22 13:52:49 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: <u>FR-7700-NFPA 70-2024</u>

**Statement:** This revision establishes a new Section 800.93 Grounding, Bonding or Interruption of Metallic Members of Cables and incorporates the common requirements of 805.93, 820.93, and 830.93.

rpa			
800.53 Separa	ation from Lightning Conductors.		
Where practica lightning protec <u>fiber cables,</u> ar	Where practicable on buildings, a separation of at least 1.8 m (6 ft) shall be maintained between lightning protection conductors and all communications wires and cables, <u>conductive optical fiber cables</u> , and CATV-type coaxial cables.		
Informatio <del>Code</del> <u>Coc</u> informatio	onal Note No. 1: See <del>ANSI</del> <u>C2-</u> 2017-2023, National Electrical Safety de® (NESC®), Part 2, Safety Rules for Overhead Lines, for additional on regarding overhead (aerial) wires and cables.		
Information Protection sideflash	onal Note No. 2: See NFPA 780 <del>-2020</del> , <i>Standard for the Installation of Lightning of Systems</i> , for information on calculation of separation distances using the equation.		
atement of Prob	lem and Substantiation for Public Input		
Multiple PIs have b communications, th	been submitted to include optical fiber cables in Article 800 when they are used fo hereby increasing the usability of Article 800.		
The reference to th	e National Electrical Safety Code has been updated.		
The edition date fo			
2023 NEC states " the latest edition of	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered if the standard."		
2023 NEC states " the latest edition of ubmitter Informa	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered the standard." tion Verification		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered the standard." <b>tion Verification</b> <b>me:</b> Leslie Jutte		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." tion Verification me: Leslie Jutte Plastics Industry Association		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." tion Verification me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." <b>tion Verification</b> <b>me:</b> Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address: City:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." tion Verification me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address: City: State: Zin:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." tion Verification me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS)		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address: City: State: Zip: Submittal Date:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." tion Verification me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jul 25 07:16:06 EDT 2023		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee:	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." <b>tion Verification</b> me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jul 25 07:16:06 EDT 2023 NEC-P16		
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2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee Statem Resolution: FR-7	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." <b>tion Verification</b> me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jul 25 07:16:06 EDT 2023 NEC-P16 Ment		
2023 NEC states " the latest edition of ubmitter Informa Submitter Full Na Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee Statem Resolution: <u>FR-7</u> Statement: This in code	r NFPA 780A has been deleted because it is not needed. Section 90.5(C) in the Unless the standard reference includes a date, the reference is to be considered i the standard." tion Verification me: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jul 25 07:16:06 EDT 2023 NEC-P16 nent 677-NFPA 70-2024 revision incorporates optical fiber cable in Article 800 to enhance usability of the		

#### Public Input No. 3341-NFPA 70-2023 [ Sections 800.100, 800.106 ] Sections 800.100, 800.106 800.100 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 corrosionresistant 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 have a current-carrying capacity not less than the aggregate of the grounded metal cable sheath member, the metal strength member(s), and the protected conductor(s) of the communications cable, or the outer sheath of the coaxial cable, as applicable. 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. See ANSI/TIA-607-D-2019, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises, which includes useful information to reduce such voltages. Exception: In one- and two-family dwellings if 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 800.100(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 800.100(C), and the 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. If 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), (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.

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 Equipped With an Intersystem Bonding Termination or Terminal Block Providing Access To the Building Grounding Means.



(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 power service accessible means external to enclosures using the options identified in 250.94(A) , Exception
- (3) The nonflexible metal power service raceway
- (4) The service equipment enclosure
- (5) The grounding electrode conductor or the grounding electrode conductor metal enclosure of the power service
- (6) 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
- (7) 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

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 located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means connected to an electrode by a grounding electrode conductor in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: See Informational Note Figure 800.100(B)(2) for an illustration of a grounding electrode conductor and a bonding conductor in a communications installation not equipped with an intersystem bonding termination or terminal block.

Figure Informational Note Figure 800.100(B)(2) Illustration of a Grounding Electrode Conductor and a Bonding Conductor in a Communications Installation Not Equipped with an Intersystem Bonding Termination or Terminal Block Providing Access to the Building Grounding Means.



(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 one of the following:

- 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 800.100(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 covered in Article 805 or network-powered broadband communications systems covered in Article 830, 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 pipes, hot water pipes, or lightning protection system conductors shall not be employed as grounding electrodes or as a bonding or grounding electrode conductor for protectors and grounded metal 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 grounding electrode and power grounding electrode system at the building or structure served if separate electrodes are used.

Exception: Bonding of electrodes at mobile homes shall be in accordance with 800.106.

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.

800.106 Primary Protector Grounding and Bonding at Mobile Homes.

(A) Grounding.

Grounding shall comply with 800.106(A)(1) and (A)(2).

#### (1) Mobile Home Service Equipment.

Where there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, grounding shall comply with one of the following:

- The following components (if present) shall be connected to a grounding electrode in accordance with 800.100(B)(3) :
  - (2) Primary protector grounding terminal
  - (3) Network interface unit
  - (4) Coaxial cable shield ground
  - (5) Surge arrester grounding terminal
  - (6) Network-powered broadband communications cable shield
  - (7) Network-powered broadband communications cable metal members not used for communications or powering
- (8) The non-current-carrying metal members of optical fiber cables shall be connected to a grounding electrode in accordance with 770.106(A)(1). The network terminal, if required to be grounded, shall be connected to a grounding electrode in accordance with 800.106(A)(1)(1). The grounding electrode shall be bonded in accordance with 770.106(B).

#### (2) Mobile Home Feeder Disconnecting Means.

Where there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, grounding shall comply with one of the following:

- The following components (if present) shall be connected to a grounding electrode in accordance with 800.100(B)(3) :
  - (2) Primary protector grounding terminal
  - (3) Network interface unit
  - (4) Network-powered broadband communications shield
  - (5) Network-powered broadband communications cable metal members not used for communications or powering
- (6) The non-current-carrying metal members of optical fiber cables shall be connected to a grounding electrode in accordance with 770.106(A)(2). The network terminal, if required to be grounded, shall be connected to a grounding electrode in accordance with 800.106(A)(2). The grounding electrode shall be bonded in accordance with 770.106(B).

Relationship

#### (B) Bonding.

The primary protector grounding terminal or grounding electrode, network-powered broadband communications cable grounding terminal, or network interface unit grounding terminal shall be bonded together and connected to the metal frame or available grounding terminal of the mobile home with a copper conductor not smaller than 12 AWG under either of the following conditions:

(1) If there is no mobile home service equipment or disconnecting means as in 800.106(A)

(2) If the mobile home is supplied by cord and plug

#### **Additional Proposed Changes**

File Name	<b>Description</b>	<u>Approved</u>
Limited_Energy_TG_Substantiation.docx	Limited Energy TG Chair Substantiation	

#### Statement of Problem and Substantiation for Public Input

As part of the work by the Limited Energy TG, the section is deleted as it is relocated into the new Limited Energy Grounding, Bonding, and Primary Protective Article.

#### **Related Public Inputs for This Document**

 Related Input

 Public Input No. 3340-NFPA 70-2023 [Section No. 800.49]

 Public Input No. 3342-NFPA 70-2023 [Section No. 800.180]

#### **Submitter Information Verification**

Submitter Full Name: Derrick AtkinsOrganization:Minneapolis Electrical JATCStreet Address:City:State:Zip:Submittal Date:Fri Sep 01 13:56:09 EDT 2023Committee:NEC-P16

#### **Committee Statement**

**Resolution:** For clarity and ease-of-use it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X00 does not address the proposed revisions of PI 1189, PI200, PI4069, PI 1991, and PI 992, which were submitted to modify 800.100 and 800.106. This would result in conflicts between the new X50 Article and possible First Draft actions on these PIs.

#### **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



NFPA	Public Inpu	t No. 1189-NFPA 70-2023 [ Section No. 800.100(A)(3) ]			
	(3) Size.				
	The bonding conductor or grounding electrode conductor shall not be smaller than 14 AWG. The bonding conductor or grounding electrode conductor shall have a current-carrying capacity not less than the aggregate of the grounded metal cable sheath member, the metal strength member(s), and the protected conductor(s) of the communications cable, <u>conductive optical fiber cable</u> , or the outer sheath of the coaxial cable, as applicable. The bonding conductor or grounding electrode conductor shall not be required to exceed 6 AWG.				
Staten	Statement of Problem and Substantiation for Public Input				
Opt	tical fiber cabl	es are included to improve usability.			
Submi	Submitter Information Verification				
Sub	omitter Full N	lame: Leslie Jutte			
Org	anization:	Plastics Industry Association			
Affi	iliation:	Plastics Industry Association (PLASTICS)			
Stre	eet Address:				
City	y:				
Sta	te:				
Zip	:				
Sub	omittal Date:	Thu Jun 22 14:04:58 EDT 2023			
Cor	mmittee:	NEC-P16			
Comm	Committee Statement				
Res	solution: <u>FR</u>	-7709-NFPA 70-2024			
Sta	tement: Thi cor into	s revision adds conductive optical fiber cable to the requirements. This aligns with the asolidation efforts of moving communications applications of optical fiber requirements of Article 800.			



**Statement:** Section 800.180 for Grounding Devices in Part V Listing requirements, requires that the grounding device be a listed device or be part of listed equipment. This requirement is

not a listing requirement, but an installation requirement and has therefore been moved to Part III, Grounding Methods.



The creation this new 800.108 covering communications cables enables the deletion the

now redundant reference to Article 770 within 800.3(H).

<b>(1)</b> Mo	bile Home Service Equipment.
Where wall of t	<u>If</u> there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior the mobile home it serves, grounding shall comply with one of the following:
(1) The ace	e following components (if present) shall be connected to a grounding electrode in cordance with 800.100(B)(3):
(2)	Primary protector grounding terminal
(3)	Network interface unit or network terminal
(4)	Coaxial cable shield ground
(5)	Surge arrester grounding terminal
(6)	Network-powered broadband communications cable shield
(7)	<u>Network-powered broadband communications cable metal members not used for</u> <u>communications or powering</u>
<del>The n</del>	on
(8)	
a.	Non -current-carrying metal members of conductive optical fiber cables
<del>shall termir accor with 7</del>	be connected to a grounding electrode in accordance with 770.106(A)(1). The networl nal, if required to be grounded, shall be connected to a grounding electrode in dance with 800.106(A)(1)(1). The grounding electrode shall be bonded in accordance <sup>770.106(B)</sup> .
(9)	
a.	

Multiple PIs have been submitted to include optical fiber cables in Article 800 when they are used for communications, thereby increasing the usability of Article 800. To coordinate with those PIs, the recommended text deletes reference to Article 770 and includes grounding of conductive optical fiber cables in 800.106(A)(1) as new subsection "g".

Relationship

Companion PI

#### **Related Public Inputs for This Document**

#### **Related Input**

Public Input No. 1992-NFPA 70-2023 [Section No. 800.106(A)(2)] Public Input No. 1992-NFPA 70-2023 [Section No. 800.106(A)(2)]

#### Submitter Information Verification

Submitter Full Name: Leslie JutteOrganization:Plastics Industry AssociationAffiliation:Plastics Industry Association (PLASTICS)

https://submittals.nfpa.org/TerraViewWeb/ViewerPage.jsp

Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu Aug 10 10:07:16 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: FR-7956-NFPA 70-2024

**Statement:** Several actions have been made to include optical fiber cables in Article 800 when they are used for communications, thereby increasing the usability of Article 800. This revision aligns this effort by removing the reference to article 770. Additionally, an editorial change was made to align with the NEC style manual.


# **Submitter Information Verification**

Submitter Full Name: Leslie Jutte				
Plastics Industry Association				
Plastics Industry Association (PLASTICS)				
Thu Aug 10 10:21:05 EDT 2023				
NEC-P16				

# **Committee Statement**

Resolution: FR-7956-NFPA 70-2024

**Statement:** Several actions have been made to include optical fiber cables in Article 800 when they are used for communications, thereby increasing the usability of Article 800. This revision aligns this effort by removing the reference to article 770. Additionally, an editorial change was made to align with the NEC style manual.



#### Resolution: FR-7663-NFPA 70-2024

**Statement:** This revision creates a new Section 800.108 within the appropriate Part III (Grounding Methods) of the general Article 800 covering the common grounding and bonding requirements for non-current-carrying conductive members and shields of communications cables within buildings. This continues the consolidation of general rules for communications cables in Article 800.

The creation this new 800.108 covering communications cables enables the deletion the now redundant reference to Article 770 within 800.3(H).



# Public Input No. 24-NFPA 70-2023 [ Section No. 800.113(B)(2) ]

#### (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in ducts specifically fabricated for environmental air as described in 300.22(B):

- (1) Plenum, riser, and general-purpose communications raceways
- (2) Plenum, riser, and general-purpose cable routing assemblies
- (3) Riser, general-purpose, and limited-use cables
- (4) Type CMUC cables and wires
- (5) Types BMU and BLU cables
- (6) Communications wires
- (7) Hybrid power and communications cables

Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, Chapter 10, Electrical and Optical Fiber Wiring and Equipment in Plenums and Ducts for information on fire protection of wiring installed in fabricated ducts.

#### Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

The current edition of NFPA 90A, the 2024 edition, has been significantly reorganized. In previous editions, electrical requirements for installation in ducts and plenums were in Chapter 4, HVAC Systems. The 2024 edition has a new Chapter 10, Electrical and Optical Fiber Wiring and Equipment in Plenums and Ducts. Consequently, Informational Notes referencing electrical requirements in NFPA 90A need to be revised.

# **Related Public Inputs for This Document**

#### Related Input

Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)] Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)] Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)] Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)] Public Input No. 26-NFPA 70-2023 [Section No. 800.170] Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)] Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]

#### **Relationship**

Revise NFPA 90A reference Revise NFPA 90A reference

# **Submitter Information Verification**

Organization:	CableSafe, Inc./OFS
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State:	
Zip:	
Submittal Date:	Wed Jan 04 11:09:24 EST 2023
Committee:	NEC-P16

# **Committee Statement**

Resolution: FR-7747-NFPA 70-2024

**Statement:** Revised informational note to align with the NEC style manual and added a reference to NFPA 90A, Chapter 10 for user clarity.

# Public Input No. 25-NFPA 70-2023 [ Section No. 800.113(C)(2) ]

#### (2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in other spaces used for environmental air as described in 300.22(C):

- (1) Riser, general-purpose, and limited-use cables
- (2) Riser and general-purpose communications raceways
- (3) Riser and general-purpose cable routing assemblies
- (4) Type CMUC cables and wires
- (5) Types BMR, BM, BMU, and BLU cables
- (6) Communications wires
- (7) Hybrid power and communications cables

Informational Note: See NFPA 90A-2021, Standard for the Installation of Air-Conditioning and Ventilating Systems, Chapter 10, Electrical and Optical Fiber Wiring and Equipment in Plenums and \_ Ducts \_ for information on fire protection of wiring installed in other spaces used for environmental air.

#### Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

The current edition of NFPA 90A, the 2024 edition, has been significantly reorganized. In previous editions, electrical requirements for installation in ducts and plenums were in Chapter 4, HVAC Systems. The 2024 edition has a new Chapter 10, Electrical and Optical Fiber Wiring and Equipment in Plenums and Ducts. Consequently, Informational Notes referencing electrical requirements in NFPA 90A need to be revised.

# **Related Public Inputs for This Document**

#### Related Input

Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)] Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)] Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)] Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)] Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)] Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)] Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)] Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)] Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)] Public Input No. 26-NFPA 70-2023 [Section No. 800.170] Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)] Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]

#### **Relationship**

Revise NFPA 90A reference Revise NFPA 90A reference

# **Submitter Information Verification**

Organization:	CableSafe, Inc./OFS
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City:	
State:	
Zip:	
Submittal Date:	Wed Jan 04 11:11:09 EST 2023
Committee:	NEC-P16

# **Committee Statement**

Resolution: FR-7749-NFPA 70-2024

**Statement:** Revised informational note to align with the NEC style manual and added a reference to NFPA 90A, Chapter 10 for user clarity.

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Pub NFPA	olic Input No. 978-NFPA 70-2023 [ Section No. 800.113(H)(2) ]
(2)	Uses Not Permitted.
The	following cables and wires shall not be supported by cable travs:
(1)	
(1)	Type CMUC cables and wires
(2)	Type BMU and BUU cables
(3)	
(4)	Uninterimentations whes
(5)	Hybrid power and communications cables, unless also listed at type TC cable
such, tł tronics to supp addres <b>Submitte</b>	ne prior prohibitions to installing these hybrid communications cables in tray made sense. Gai- makes such a product and their listing specifically lists the cable as type TC, so this prohibition porting it with a cable tray should not apply. See the Gai-tronics Cable Selection Guide at this s for documentation: https://hubbellcdn.com/literature/SKU-GTC-PUB-020212.pdf <b>r Information Verification</b>
Submit	tter Full Name: Richard Holub
Organi	zation: The DuPont Company, Inc.
Street /	Address:
City: Stato:	
Zin <sup>.</sup>	
Submit	ttal Date: Thu Jun 08 08:43:27 EDT 2023
Commi	ittee: NEC-P16
Committe	ee Statement
Resolu	Ition: TC cables are already permitted for use in cable trays by Article 336. The inclusion of an exception in 800.113(H)(2) is not required.

<u>800.114 (</u>	<u>Grounding. The non-current-carrying conductive members of conductive optical fiber</u>		
<u>cables, and the shields of cables used for communications installed in buildings shall be bonded to a grounded equipment rack or enclosure, or grounded in accordance with the grounding methods specified in 800.100(B) using a conductor specified in 800.100(A).</u>			
tement of	Problem and Substantiation for Public Input		
The recomm Grounding. N grounded eq specified by includes grou communicati	ended text for new section 800.114 is parallel to the text for 770.114 which states: 770. Non-current-carrying conductive members of optical fiber cables shall be bonded to a uppment rack or enclosure, or grounded in accordance with the grounding methods 770.100(B) using a conductor specified in 770.100(A). However, the recommended tex unding of the metallic members of conductive optical fiber cables as well as the shields fons cables in order to include all cables used for communications.		
omitter Inf	ormation Verification		
Submitter F			
	uli Name: Leslie Jutte		
Organizatio	n: Plastics Industry Association		
Organization Affiliation: Street Addre City: State:	<b>ull Name:</b> Leslie Jutte <b>n:</b> Plastics Industry Association Plastics Industry Association (PLASTICS) <b>ess:</b>		
Organization Affiliation: Street Addre City: State: Zip:	<b>ull Name:</b> Leslie Jutte <b>n:</b> Plastics Industry Association Plastics Industry Association (PLASTICS) <b>ess:</b>		
Organization Affiliation: Street Addre City: State: Zip: Submittal D	uil Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Fri Aug 18 11:44:55 EDT 2023         NEC P16		
Organization Affiliation: Street Addre City: State: Zip: Submittal D Committee:	uil Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Fri Aug 18 11:44:55 EDT 2023         NEC-P16		
Organization Affiliation: Street Addre City: State: Zip: Submittal Di Committee: mmittee St	uil Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Fri Aug 18 11:44:55 EDT 2023         NEC-P16         tatement		
Organization Affiliation: Street Addre City: State: Zip: Submittal De Committee St Resolution:	uil Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Fri Aug 18 11:44:55 EDT 2023         NEC-P16         tatement <u>FR-7663-NFPA 70-2024</u> This revision creates a new Section 200 102 within the appropriate Dart III (Creunding		
Organization Affiliation: Street Addre City: State: Zip: Submittal Di Committee: mmittee St Resolution: Statement:	ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Fri Aug 18 11:44:55 EDT 2023         NEC-P16         tatement <u>FR-7663-NFPA 70-2024</u> This revision creates a new Section 800.108 within the appropriate Part III (Grounding Methods) of the general Article 800 covering the common grounding and bonding requirements for non-current-carrying conductive members and shields of communications cables within buildings. This continues the consolidation of general ru for communications cables in Article 800.		

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<ul> <li>Installation of communications wires and cables, from the protector to the equipment, or when protector is required, communications wires and cables attached to the outside or inside the building, shall comply with 800.133(A) and through 800.133(B). Installation of CATV-type coaxial cables, beyond the point of grounding as defined in 820.93, shall comply with 800.133(A) through (C). Installation of optical fiber cables shall comply with 800.133(A) through (C).</li> <li>(A) In Raceways, Cable Trays, Boxes, Cables, Enclosures, and Cable Routing Assemblies (1) Other Circuits.</li> <li>Communications cables and CATV-type coaxial cables shall be permitted in the same racewer cable tray, box, enclosure, or cable routing assembly together and with jacketed cables of at of the following:</li> <li>(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance 645.5(E)(2) or Parts I and II of Article 725</li> <li>(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760</li> <li>(3) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770</li> <li>(4) Communications circuits in compliance with Parts I and IV of Articles 800 and 805</li> <li>(5) Community antenna television and radio distribution systems in compliance with Parts I and V of Articles 800 and 820</li> <li>(6) Low-power network-powered broadband communications circuits in compliance with Parts I and V of Articles 800 and 830</li> <li>(2) Class 2 and Class 3 Circuits.</li> <li>Class 1 circuits shall not be run in the same cable with communications circuits. Class 2 and Class 3 circuits.</li> </ul>	800 and	<b>).133</b> Installation of Communications Wires and Cables- and ,_ CATV-Type Coaxial Cab <u>J Optical Fiber Cables</u> .
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(3) Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes.

Communications wires and cables and CATV-type coaxial cables 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: Communications wires and cables and CATV-type coaxial cables shall be permitted to be placed in any raceway, compartment, outlet box, junction box, or other enclosures with conductors of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits 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 communications wires and cables and CATV-type coaxial cables by a permanent barrier or listed divider.

Exception No. 2: Communications wires and cables and CATV-type coaxial cables shall be permitted to be placed in outlet boxes, junction boxes, or similar fittings or compartments with power conductors where such conductors are introduced solely for power supply to the communications and coaxial cable system distribution equipment. The power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (¼ in.) separation from the communications wires and cables and the CATV- type coaxial cables.

*Exception No. 3: Separation of circuits shall not be required in elevator traveling cables constructed in accordance with by 620.36.* 

(B) Other Applications.

Communications wires and cables and CATV-type coaxial cables shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits.

Exception No. 1: Separation shall not be required where either (1) all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC or Type UF cables, or (2) all of the communications wires and cables and all of the CATV-type coaxial cables are encased in raceway.

Exception No. 2: Separation shall not be required where the communications wires and cables and CATV-type coaxial cables are permanently separated from the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(C) Support of Communications Wires and Cables and CATV-Type Coaxial Cables.

Raceways shall be used for their intended purpose. Communications wires and cables and CATV-type coaxial cables shall not be strapped, taped, or attached by any means to the exterior of any raceway as a means of support.

Exception: Overhead (aerial) spans of communications drop wires, communications cables, and CATV-type coaxial cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such wires and cables.

# Statement of Problem and Substantiation for Public Input

Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this PI expands 800.133 to include optical fiber cables.

#### **Submitter Information Verification**

Submitter Full Name: Leslie JutteOrganization:Plastics Industry Association

Affiliation: Street Addre City: State: Zin:	Plastics Industry Association (PLASTICS)	
Zip: Submittal D	ate: Thu Jun 22 09:40:24 FDT 2023	
Committee:	NEC-P16	
Committee St	atement	
Resolution:	FR-7773-NFPA 70-2024	
Statement:	Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113 this expands 800.133 to include optical fiber cables. Cross references have been updated to Article 800 accordingly.	



(D)	Other Applications
רסו	- Other Applications.

Communications wires and cables and CATV-type coaxial cables shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits.

Exception No. 1: Separation shall not be required where either (1) all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power networkpowered broadband communications circuits are in a raceway or in metal-sheathed, metalclad, nonmetallic-sheathed, Type AC or Type UF cables, or (2) all of the communications wires and cables and all of the CATV-type coaxial cables are encased in raceway.

Exception No. 2: Separation shall not be required where the communications wires and cables and CATV-type coaxial cables are permanently separated from the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power networkpowered broadband communications circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

#### **Additional Proposed Changes**

 File Name

 Limited\_Energy\_TG\_First\_Draft\_Substantiation.docx
 First I

Description First Draft Substantiation **Approved** 

#### Statement of Problem and Substantiation for Public Input

This text is being deleted as part of the reorganization of the limited energy articles. The deleted text is relocated as a general requirement to new Article X00.

#### **Submitter Information Verification**

Submitter Full Name: Mark HilbertOrganization:MR Hilbert Insp. & TrainingStreet Address:-City:-State:-Zip:-Submittal Date:Sun Sep 03 06:24:17 EDT 2023Committee:NEC-P16

#### **Committee Statement**

**Resolution:** Resolve / The text from Article 800 is not relocated but greatly shortened and technically altered in the Section X00.100 of the new proposed Article X00 under PI-3234. There is no technical justification supplied for the technical changes to the text. There are several PIs including PI-1667, PI-2966, PI-3930, Pi-4036, PI-899, PI-4175, PI-1178, PI-1179, Pi-1176, and PI-3670, which have been submitted to modify 800.133 with concerns of updates, word changes, and deletions to the text. Without including such revisions, the result will create conflicts and confusion between the new X00 Article and possible First Draft actions on these PIs.

# **Substantiation**

The NEC Correlating Committee has created several task groups for the 2026 cycle, but specifically, has created one group to look at the long-term enhancement of the National Electrical Code. This group has looked at and determined that the rapidly changing technology landscape requires that the Limited Power Articles of Chapter 7 and the Communication Articles of Chapter 8, be revised to provide greater usability and clarity for today's world.

This Public Input is one of a series of Public Inputs to increase the usability of the existing limited energy requirements.

Nearly 30 industry professionals were split among five different Sub Task Groups. Additional meetings were held among the Sub Task Group Chairs to share ideas, complications, correlation issues and other information. Overall dozens of meetings were held to work on this project.

The Task group members for this work include: Derrick Atkins, Tom Domitrovich, Ernie Gallo, Scott Harding, Mark Hilbert, Chad Jones, Alan Manche, Ken McKinney, Nathan Phillips, Dan Ashton, George Bish, Trevor Bowmer, Shane Clary, Michael Cogbill, Jim Conrad, Adam Corbin, Dale Crawford, Ray Horner, Ryan Jackson, Stan Kaufman, Kyle Krueger, William McCoy, Tim Mikloiche, Samuel Rokowski, Anthony Tassone, Ron Tellas, Keith Waters, John Williams and George Zimmerman.

The task group recommends restructuring of the limited energy articles to include protection, cable installation requirements and equipment, similar in concept to the structure used in other parts of the NEC.

To accomplish this, the following is a suggested course of action:

- 1. Create a limited power NEC structure where the main focus is not the technology but rather the installation requirements of the cable.
- 2. Articles that look similar to general requirements, wiring, overcurrent protection and grounding.
- 3. Restructuring of Articles as follows:
  - a. Existing Article 722, will take on the look and theme of 310 and 315 and placed in new Article X22
  - b. New grounding and bonding Article X50 will be similar to 250.
  - c. New overcurrent protection Article X90 will be similar to current Article 240. New Article X90 was chosen in lieu of X40, since there currently is an Article 840 (in case the new Articles are placed in Article 800)
  - d. Existing Articles 724, 725, and 726, will take on the look and theme of branch circuits with the general requirements placed in new Article X00, the installation requirements in X22, the grounding requirements in X50 and the protection requirements X90.

The goal of these Articles both existing and new is to ultimately locate all content into one chapter in 2029.

The following information and diagrams are provided to outline the thought process.

Section X00.100 combines the separation requirements from 133, 136 and 139 in 725, 726, 760, 770 along with the separation requirements in 800, 805 and 815.

This was the logic the sub task group used to develop what we are calling the X00.100 separation requirements.

The structure follows this logic:

- The list of all limited energy cables is called for in X22.
- A Limited Energy cable has the following construction when placed in a Limited Energy System.



The structure of X00.100 follows the following hierarchy:

- X00.100 (A) is the blue block
- X00.100 (B) and (C) are the green block
- X00.100 (D) and (E) are the salmon block
- $\circ$  X00.100 (F) (G) (H) (I) are the yellow block



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(1)	Other Circuits.
<del>Cor</del> <u>liste</u> enc	nmunications cables and <u>Listed communications cables, listed optical fiber cables, and</u> ed_CATV-type coaxial cables shall be permitted in the same raceway, cable tray, box, losure, or cable routing assembly together and with <del>jacketed cables of</del> any of the following
(1)	<u>Listed</u> Class 2 and Class 3 remote-control, signaling, and power-limited <del>circuits</del> <u>cables</u> <u>installed</u> in compliance with 645.5(E)(2) or <u>Article 725</u> , Parts I and II- <del>of Article 725</del>
(2)	- <del>Power</del> <u>Listed power</u> -limited fire alarm <del>systems</del> <u>cables installed</u> in compliance with <u>Artic</u> <u>760,</u> Parts I and III- <del>of Article 760</del>
(3)	- Nonconductive- Listed nonconductive and conductive optical fiber cables
(4) ∀	Listed communications cables installed in compliance with Article 800, Parts I and of Article 770
(5) <del>Co</del>	Communications circuits in compliance with <u>IV, and Article 805,</u> Parts I and <del>IV of Articles 800 and 805</del> <del>800 and 805</del> ommunity
(6)	Ш
(7) <del>Le</del>	Listed community_antenna television and radio distribution <del>systems-</del> <u>coaxial cables</u> installed_in compliance with <u>Article 800,</u> Parts I and V- <del>of Articles 800 and 820</del>
(8)	, Article 820. Part I
(9)	<u>Listed low</u> -power network-powered broadband communications <del>circuits</del> <u>cables installed</u> in compliance with <u>Article 800</u> , Parts I and V- <del>of Articles 800</del> , and <u>Article</u> 830. <u>Parts I and</u> <u>V</u>

Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this PI expands 800.133(A) (1) to include optical fiber cables.

In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3 and fire alarm cables, which are always listed.

Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". "Circuits" was changed to "cables" to clarify that this section is about which cables are permitted to be run together in the same pathway.

# **Submitter Information Verification**

Submitter Full Name: Leslie JutteOrganization:Plastics Industry AssociationAffiliation:Plastics Industry Association (PLASTICS)Street Address:Vertex Address:

City:	
State:	
Zip:	
Submittal D	ate: Fri Jul 28 09:51:42 EDT 2023
Committee:	NEC-P16
Committee S	tatement
Resolution	<u>FR-7768-NFPA 70-2024</u>
Statement:	Revision reflects that cables must be listed and other readability improvements and class 4 cables have been added because they are allowed to be routed within the same raceway as the circuits covered within the 800.133.

(1) Cor cab	Other Circuits. mmunications c le tray, box, end	ables and CATV-type coaxial cables shall be permitted in the same raceway, closure, or cable routing assembly together and with jacketed cables of any
(1)	Class 2 and 0 with 645.5(E)(	Class 3 remote-control, signaling, and power-limited circuits in compliance 2) or Article 725. Parts I and II- <del>of Article 725</del>
(2)	Power-limited	fire alarm systems in compliance with <u>Article 760,</u> Parts I and III- <del>of Article</del>
(3)	Nonconductiv and <del>V of Articl</del>	e and conductive optical fiber cables in compliance with <u>Article 770,</u> Parts I <del>e 770</del> <u>V</u>
(4)	Communication Articles 800 an	ons circuits in compliance with <u>Articles 800 and 805,</u> Parts I and IV- <del>of</del> <del>nd 805</del>
(5)	Community a with Article 80	ntenna television and radio distribution systems in compliance <del>with</del> <u>0 and 820,</u> Parts I and V- <del>of Articles 800 and 820</del>
(6)		
This Print This Print in orde Style M 4.1.4 F	Low-power ne Article 800 and t of Probler ublic Input is be r to provide cor lanual Section References to an	etwork-powered broadband communications circuits in compliance with <u>d 830,</u> Parts I and V- <del>of Articles 800 and 830</del> <b>n and Substantiation for Public Input</b> ing submitted on behalf of the NEC Correlating Committee Usability Task Group relation throughout the document. The text is revised to to comply with the NEC 4.1.4, regarding the use of Parts. In Entire Article. References shall not be made to an entire article, except for the
This Print in orde Style M 4.1.4 F Article articles numbe The Us Chad F	Low-power ne Article 800 and t of Probler ublic Input is be r to provide cor lanual Section References to an 100 or where re shall be permi r shall precede sability Task Gro Kennedy and D	etwork-powered broadband communications circuits in compliance with <u>d 830,</u> Parts I and V- of Articles 800 and 830 <b>m and Substantiation for Public Input</b> ing submitted on behalf of the NEC Correlating Committee Usability Task Group relation throughout the document. The text is revised to to comply with the NEC 4.1.4, regarding the use of Parts. In Entire Article. References shall not be made to an entire article, except for the efferenced to provide the necessary context. References to specific parts within tted. References to all parts of an article shall not be permitted. The article the part number. Dup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, avid Williams.
This Pu in orde Style M 4.1.4 F Article articles numbe The Us Chad F	Low-power ne Article 800 and t of Probler ublic Input is be r to provide cor fanual Section References to an 100 or where re shall be permi r shall precede sability Task Gro cennedy and D	etwork-powered broadband communications circuits in compliance with <u>A 830,</u> Parts I and V- of Articles 800 and 830 <b>m and Substantiation for Public Input</b> ing submitted on behalf of the NEC Correlating Committee Usability Task Group relation throughout the document. The text is revised to to comply with the NEC 4.1.4, regarding the use of Parts. In Entire Article. References shall not be made to an entire article, except for the efferenced to provide the necessary context. References to specific parts within tted. References to all parts of an article shall not be permitted. The article the part number. Dup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, avid Williams. <b>n Verification</b>
(6) Statemen This Pu in orde Style M 4.1.4 F Article articles numbe The Us Chad F Submitte Submitte Submitte Street City: State: Zip:	Low-power ne Article 800 and t of Probler ublic Input is be r to provide cor lanual Section References to an 100 or where re shall be permi r shall precede sability Task Gro cennedy and D r Informatio tter Full Name ization: Address:	etwork-powered broadband communications circuits in compliance with <u>4 830,</u> Parts I and V- of Articles 800 and 830 <b>n and Substantiation for Public Input</b> ing submitted on behalf of the NEC Correlating Committee Usability Task Group relation throughout the document. The text is revised to to comply with the NEC 4.1.4, regarding the use of Parts. In Entire Article. References shall not be made to an entire article, except for the efferenced to provide the necessary context. References to specific parts within tted. References to all parts of an article shall not be permitted. The article the part number. Dup members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, avid Williams. <b>n Verification</b> E David Williams Delta Charter Township

Resoluti Stateme	on: <u>FR-7768</u> nt: Revision 4 cables	3-NFPA 70-2024 reflects that cables must be listed and other readability improvements and cla have been added because they are allowed to be routed within the same
ommittee	Statemen	t
Zip: Submitta Committ	Il Date: ee:	Wed Sep 06 10:45:13 EDT 2023 NEC-P16
Street Ac City: State:	ldress:	
Submitte Organiza	er Full Name: ition:	Chad Jones Cisco Systems
ubmitter	Informatio	n Verification
Class 4 s requirem Class 4 v and not c Article 72 4 should	ystems were ents as Class vas also appro loing it was an 2 covers Clas be added to t	added in the 2023 code and have equivalent of better than fire and life safety 2 circuits. An effort to analyze all the locations of Class 2 in the code to see i opriate in the application. This effort should have happened for the 2023 code n oversight. ss 2, Class 3, and Class 4 cables and treats them all the same. Therefore, Cla his list.
tatement	of Problen	n and Substantiation for Public Input
(7) l l	₋ow-power ne and V of Artic	etwork-powered broadband communications circuits in compliance with Parts cles 800 and 830
(6) ( a	Community ar nd V of Article	ntenna television and radio distribution systems in compliance with Parts I es 800 and 820
(5)	Communicatio	ons circuits in compliance with Parts I and IV of Articles 800 and 805
(4) ( A	Nonconductiv	e and conductive optical fiber cables in compliance with Parts I and V of
(3) F	ower-limited	fire alarm systems in compliance with Parts I and III of Article 760
(2) _ A	<u>Class 4 fault i</u> . <u>rticle 72</u> 6	managed power circuits in compliance with 645.5(E)(2) and Parts I and II of
(1) ( w	Class 2 and C /ith 645.5(E)(2	Class 3 remote-control, signaling, and power-limited circuits in compliance 2) or Parts I and II of Article 725
cable of the	nunications ca tray, box, enc following:	ables and CATV-type coaxial cables shall be permitted in the same raceway, closure, or cable routing assembly together and with jacketed cables of any
Comn		

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Public Input No. 4036-NFPA 70-2023 [ Section No. 800.133(A)(1) ]
(1) Other Circuits.
Listed Communications cables and listed CATV-type coaxial cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly together and
with jacketed cables of any of the following:
(1) <u>Listed _ Class 2 and Class 3 remote-control, signaling, and power-limited</u> circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725
(2) <u>cables</u>
(3) Listed Class 4 cables
(3) Listed Power-limited fire alarm
systems in compliance with Parts I and III of Article 760 cables
(4) Listed _ Nonconductive and conductive optical fiber cables
in compliance with Parts I and V of Article 770
<ul> <li>Communications circuits in compliance with Parts I and IV of Articles 800 and 805</li> </ul>
(5) Listed _ Communications cables
(6) Listed _ Community antenna television and radio distribution
systems in compliance with Parts I and V of Articles 800 and 820 system coaxial cables
(7) Listed _ Low-power network-powered broadband communications
circuits in compliance with Parts I and V of Articles 800 and 830 cables
Statement of Problem and Substantiation for Public Input
• Changes to reflect these are listed cables and other readability improvements (e.g., no need to state in compliance with the installation rules of the Article, as already required for cabling under that Article)
Submitter Information Verification
Submitter Full Name: Jeff Silveira Organization: Bicsi Street Address: City: State: Zio:
Submittal Date: Wed Sep 06 14:39:54 EDT 2023

Committee:	NEC-P16
Committee St	atement
Resolution: Statement:	<u>FR-7768-NFPA 70-2024</u> Revision reflects that cables must be listed and other readability improvements and class 4 cables have been added because they are allowed to be routed within the same raceway as the circuits covered within the 800.133.

Public Input No. 899-NFPA 70-2023 [ Section No. 800.133(A)(1) ]
(1)- <u>With</u> _Other <del>Circuits</del> <u>Cables</u> .
Communications <u>Listed communications</u> cables and <u>Listed</u> CATV-type coaxial cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly together and with jacketed cables of any of the following:
(1) <u>Listed</u> Class 2 and Class 3 remote-control, signaling, and power-limited <del>circuits</del> <u>cables</u> <u>installed</u> in compliance with 645.5(E)(2); or <u>Article 722</u> , Part I, and Article 725, Parts I and II- <del>of Article 725</del>
Power
(2)
(3) <u>Listed Class 4 cables installed in compliance with Article 722, Part I, and Article 726, Parts I</u> and II
(4) <u>Listed power</u> -limited fire alarm systems <u>cables installed</u> in compliance with <u>Article 760</u> , Parts I and III- <del>of Article 760</del>
(5) Nonconductive Listed nonconductive and conductive optical fiber cables installed in compliance with <u>Article 770</u> , Parts I and V- of <u>Article 770</u> Communications circuits
(6)
(7) <u>Listed communications cables installed</u> in compliance with <u>Article 800</u> , Parts I and IV- of Articles 800 and 805
Community
(8)
(9) <u>Listed community</u> antenna television and radio distribution systems <u>coaxial cables</u> <u>installed</u> in compliance with <u>Article 800</u> , Parts I and <del>V of Articles 800 and 820</del> <u>Low</u>
(10) IV and Article 820. Parts Land V
(10) <u>Listed low</u> -power network-powered broadband communications <del>circuits</del> <u>cables installed</u> in compliance with <u>Article 800</u> , Parts I and <del>V of Articles 800 and 830</del> <u>IV</u> , and Article 830, <u>Parts I and V</u>
Statement of Problem and Substantiation for Public Input
The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 800.133(A)(1).
In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3 and Class 4 cables, which are always listed.
Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". "Circuits" was changed to "cables" to clarify that this section is about which cables are permitted to be run together in the same pathway.

The installation rules for communications cables were moved from Article 805 to Article 800 in the 2023

#### NEC.

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number."

# **Related Public Inputs for This Document**

#### Related Input

Public Input No. 817-NFPA 70-2023 [Section No. 725.139]

Public Input No. 818-NFPA 70-2023 [Section No. 726.139]

Public Input No. 817-NFPA 70-2023 [Section No. 725.139]

Public Input No. 818-NFPA 70-2023 [Section No. 726.139]

Public Input No. 895-NFPA 70-2023 [Section No. 760.139]

Public Input No. 918-NFPA 70-2023 [Section No. 770.133(C)]

# **Submitter Information Verification**

Submitter Full Name: David Kiddoo

Organization:	CCCA
Affiliation:	Communications Cable & Connectivity Association
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat May 27 07:22:35 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: <u>FR-7768-NFPA 70-2024</u>

**Statement:** Revision reflects that cables must be listed and other readability improvements and class 4 cables have been added because they are allowed to be routed within the same raceway as the circuits covered within the 800.133.

# <u>Relationship</u>

Revise separation rules for consistency and to recognize Class 4 cables

Revise separation rules for consistency and to recognize Class 4 cables

Public I	nput No. 4175-NFPA 70-2023 [ Section No. 800.133(A)(2) ]
(2) Clas	s 2- <del>and <u>,</u> Class 3- <del>Circuits</del> , and Class 4 Circuits</del> .
Class 1 c <del>Class 3 c</del> commun	circuits shall not be run in the same cable with communications circuits. Class 2- <del>and circuit , Class3, and Class 4 circuit</del> conductors shall be permitted in the same listed ications cable with communications circuits.
Statement of	Problem and Substantiation for Public Input
Adding Clas than fire and in the code t 2023 code a	s 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better l life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 o see if Class 4 was also appropriate in the application should have happened for the nd not doing it was an oversight.
Submitter Inf	ormation Verification
Submitter F	ull Name: Chad Jones
Organizatio	n: Cisco Systems
Street Addr	ess:
City:	
Zin <sup>.</sup>	
Submittal D	ate: Wed Sep 06 19:32:49 EDT 2023
Committee:	NEC-P16
Committee S	tatement
Resolution	<u>FR-7756-NFPA 70-2024</u>
Statement:	This revision permits Class 4 circuits and communications circuits in the same cable only if the cable is dual listed. Class 4 circuits are prohibited from being run in a communications cable because the communications cable is only rated for 300 volts where as Class 4 circuits are permitted up to 450 volts.

Public Input	No. 1178-NFPA 70-2023 [ Section No. 800.133(A)(3) ]
(3) Electric Lig Powered Broac	ht, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power Network- Iband Communications Circuits in Raceways, Compartments, and Boxes.
Communication raceway, compa power, Class 1, communications	s wires and cables and CATV-type coaxial cables shall not be placed in any artment, outlet box, junction box, or similar fitting with conductors of electric light, non-power-limited fire alarm, or medium-power network-powered broadband s circuits.
Exception No. <u>armored or me</u> placed in any r conductors of e network-power light, power, Ci broadband cor cables and CA	1: Communications wires and cables, <u>conductive optical fiber cables without an</u> <u>tal-clad-type sheath</u> , and CATV-type coaxial cables shall be permitted to be raceway, compartment, outlet box, junction box, or other enclosures with electric light, power, Class 1, non-power-limited fire alarm, or medium-power red broadband communications circuits where all of the conductors of electric lass 1, non-power-limited fire alarm, and medium-power network-powered nmunications circuits are separated from all of the communications wires and TV-type coaxial cables by a permanent barrier or listed divider.
Exception No. permitted to be power conduct communication conductors sha separation fron cables. <del>Excepti</del>	2: Communications wires and cables and CATV-type coaxial cables shall be e placed in outlet boxes, junction boxes, or similar fittings or compartments with ors where such conductors are introduced solely for power supply to the as and coaxial cable system distribution equipment. The power circuit all be routed within the enclosure to maintain a minimum 6 mm ( <sup>1</sup> / <sub>4</sub> in.) in the communications wires and cables and the CATV- type coaxial on No
<u>Exception No</u> <u>metal-clad-ty</u> <u>to occupy the</u> <u>power, Class</u> <u>network-pow</u> less.	<u>2. 3: Conductive optical fiber cables contained in an armored or</u> <u>upe sheath and nonconductive optical fiber cables shall be permitted</u> <u>the same cable tray or raceway with conductors for electric light,</u> <u>1, non-power-limited fire alarm, Type ITC, or medium-power</u> <u>rered broadband communications circuits operating at 1000 volts or</u>
Exception No. constructed in	<u>4:</u> Separation of circuits shall not be required in elevator traveling cables accordance with by 620.36.
Statement of Prob	lem and Substantiation for Public Input
Section 800.113 cc 800.113 is a list of include optical fiber	overs installation requirements for cables used for communications circuits. Table those cables. In order to coordinate with Table 800.113, this PI expands 800.133 to r cables.
Submitter Informa	tion Verification
Submitter Full Na	me: Leslie Jutte
Organization:	Plastics Industry Association
Street Address:	
City:	
State:	
∠ıp: Submittal Date:	Thu Jun 22 09:48:06 EDT 2023

Committee:	NEC-P16
Committee St	atement
Resolution: Statement:	<u>FR-7757-NFPA 70-2024</u> Section 800.133 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this revision expands 800.133 to include conductive optical fiber cables.

(B) Othe	er Applications.	
Commun <u>clad-type</u> conducto network-p	ications wires and cables <u>, conductive optical fiber cables without an armored or mo sheath,</u> and CATV-type coaxial cables shall be separated at least 50 mm (2 in.) f rs of any electric light, power, Class 1, non-power-limited fire alarm, or medium-po powered broadband communications circuits.	rom ver
Exceptic electric l powerec clad, noi wires an <u>clad-typ</u>	on No. 1: Separation shall not be required <del>where</del> <u>if</u> either (1) all of the conductors of ight, power, Class 1, non-power-limited fire alarm, and medium-power network- I broadband communications circuits are in a raceway or in metal-sheathed, metal- nmetallic-sheathed, Type AC or Type UF cables, or (2) all of the communications d cables,_ and all of the <u>conductive optical fiber cables without an armored or meta</u> <u>e sheath,_ and all of the_</u> CATV-type coaxial cables are encased in raceway.	of <u> -</u>
Exceptic cables <u>, (</u> CATV-ty power, ( commun tubes or	on No. 2: Separation shall not be required where <u>if</u> the communications wires and <u>conductive optical fiber cables without an armored or metal-clad-type sheath</u> , and pe coaxial cables are permanently separated from the conductors of electric light, Class 1, non-power-limited fire alarm, and medium-power network-powered broadb ications circuits by a continuous and firmly fixed nonconductor, such as porcelain flexible tubing, in addition to the insulation on the wire.	and
atement of		
	Problem and Substantiation for Public Input	
Section 800. 800.113 is a include optic	Problem and Substantiation for Public Input 113 covers installation requirements for cables used for communications circuits. T list of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables.	able 133
Section 800. 800.113 is a include optic	Problem and Substantiation for Public Input 113 covers installation requirements for cables used for communications circuits. T list of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables.	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F	Problem and Substantiation for Public Input 113 covers installation requirements for cables used for communications circuits. T list of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables. ormation Verification ull Name: Leslie Jutte	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organizatio	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. T         list of those cables. In order to coordinate with Table 800.113, this PI expands 800         al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation:	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. T         list of those cables. In order to coordinate with Table 800.113, this PI expands 800         al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation: Street Addre	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. This of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation: Street Addro City:	Problem and Substantiation for Public Input 113 covers installation requirements for cables used for communications circuits. T list of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables. ormation Verification ull Name: Leslie Jutte n: Plastics Industry Association Plastics Industry Association (PLASTICS) ess:	able
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation: Street Addro City: State:	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. T         list of those cables. In order to coordinate with Table 800.113, this PI expands 800         al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation: Street Addre City: State: Zip:	Problem and Substantiation for Public Input 113 covers installation requirements for cables used for communications circuits. T list of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables. ormation Verification ull Name: Leslie Jutte n: Plastics Industry Association Plastics Industry Association (PLASTICS) ess:	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter Info Submitter F Organization Affiliation: Street Addro City: State: Zip: Submittal D Committee:	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. T         list of those cables. In order to coordinate with Table 800.113, this PI expands 800         al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         ess:         ate:       Thu Jun 22 09:52:50 EDT 2023         NEC-P16	able 133
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation: Street Addre City: State: Zip: Submittal D Committee St	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. This of those cables. In order to coordinate with Table 800.113, this PI expands 800 al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         esse:         ate:       Thu Jun 22 09:52:50 EDT 2023         NEC-P16	able
Section 800. 800.113 is a include optic ubmitter Info Submitter F Organization Affiliation: Street Addre City: State: Zip: Submittal D Committee St Resolution:	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. This of those cables. In order to coordinate with Table 800.113, this PI expands 800 all fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         sess:         ate:       Thu Jun 22 09:52:50 EDT 2023         NEC-P16         statement         FR-7758-NEPA 70-2024	able
Section 800. 800.113 is a include optic ubmitter Info Submitter Info Submitter F Organization Affiliation: Street Addro City: State: Zip: Submittal D Committee St Resolution: Statement	Problem and Substantiation for Public Input         113 covers installation requirements for cables used for communications circuits. T         list of those cables. In order to coordinate with Table 800.113, this PI expands 800         al fiber cables.         ormation Verification         ull Name: Leslie Jutte         n:       Plastics Industry Association         Plastics Industry Association (PLASTICS)         sess:         ate:       Thu Jun 22 09:52:50 EDT 2023         NEC-P16         satement <u>FR-7758-NFPA 70-2024</u> Section 800.133 covers installation requirements for cables used for communication	able 133

Public I	nput No. 1176-NFPA 70-2023 [ Section No. 800.133(C) ]	
NFPA		
( <b>C)</b> Sup Coaxial (	(C) Support of Communications Wires and Cables- and <u>Optical Fiber Cables</u> , CATV-Type Coaxial Cables and Network-Powered Broadband Communications Cables.	
Raceway <u>optical fik</u> <u>communi</u> of any rad	rs shall be used for their intended purpose. Communications wires and cables- <del>and , oer cables,</del> CATV-type coaxial cables <u>, and network-powered broadband</u> ications cables, shall not be strapped, taped, or attached by any means to the exterior ceway as a means of support.	
Exceptic <del>and</del> <u>opt</u> <u>commur</u> mast int	Exception: Overhead (aerial) spans of communications drop wires, communications cables, and optical fiber cables, CATV-type coaxial cables, and network-powered broadband communications cables, shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such wires and cables.	
Statement of	Problem and Substantiation for Public Input	
	•	
Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this PI expands 800.133 to include CATV-type coaxial cables, optical fiber cables, and network-powered broadband communications cables.		
Submitter Inf	ormation Verification	
Submitter F	ull Name: Leslie Jutte	
Organizatio	n: Plastics Industry Association	
Affiliation:	Plastics Industry Association (PLASTICS)	
Street Addr	ess:	
City:		
State:		
Zip:		
Submittal D	ate: Thu Jun 22 06:48:30 EDT 2023	
Committee:	NEC-P16	
Committee St	tatement	
Resolution:	FR-7760-NFPA 70-2024	
Statement:	Section 800.133 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this revision expands 800.133 to include CATV-type coaxial cables, optical fiber cables, and network-powered broadband communications cables.	

# Public Input No. 3670-NFPA 70-2023 [ Section No. 800.133 [Excluding any NFPA Sub-Sections] ]

Installation of communications wires and cables, from the protector to the equipment, or where no protector is required, communications wires and cables attached to the outside or inside of the building, shall comply with 800.133(A) and 800.133(B). Installation of CATV-type coaxial cables, beyond the point of grounding as defined in  $\frac{820}{800} \frac{800}{.93} \frac{(A)}{(A)}$ , (B)(2) and (C)(2), shall comply with 800.133(A) through (C).

# Statement of Problem and Substantiation for Public Input

To increase clarity and help code users by gathering as many common requirements in a single general communications Article 800, a series of revisions have been submitted to consolidate the common "Grounding, Bonding and Interruption" criteria of 805.93, 820.93, 830.93 and 840.93 into the General Article 800 under a new section 800.93.

No technical changes are intended or envisioned by these changes.

This revision to 800.133 is to replace references to the old 820.93 sections with equivalent references to the new 800.93.

Several related and correlated revisions will be required to create the new 800.93 including 1. The creation of a new section (820.90) to accommodate the protector requirements currently in 820.93 into a new section more accurately entitled "protectors" and numbered to be parallel with other related protection sections 805.90, 830.90 and 840.90.

 A revision to create a new 800.93 section to gather the common requirements for "Grounding, Bonding and Interruption" criteria of 805.93, 820.93, 830.93 and 840.93 into the General Article 800.
 Delete 820.93 since all the requirements will now be covered in the new 800.93 and the new 820.90

4. Delete 830.93 since all the requirements will now be covered in the new 800.93

5. Revise 840.93 to replace references to the old 805.93 and 820.93 sections with equivalent references to the new 800.93

6. Revise 840.94 to replace references to the old 805.93 sections with equivalent references to the new 800.93

7. Delete 805.93 since all the requirements will now be covered in the new 800.93

This revisions continues the consolidation efforts of last 2-3 code cycles to gather common requirements for communications cables and systems into Article 800.

# **Related Public Inputs for This Document**

#### Related Input

#### **Relationship**

Public Input No. 3645-NFPA 70-2023 [New Part after III.] Public Input No. 3650-NFPA 70-2023 [New Part after III.] Public Input No. 3654-NFPA 70-2023 [Section No. 820.93] Public Input No. 3660-NFPA 70-2023 [Section No. 805.93] Public Input No. 3661-NFPA 70-2023 [Section No. 830.93] Public Input No. 3663-NFPA 70-2023 [Section No. 840.93] Public Input No. 3666-NFPA 70-2023 [Section No. 840.94] Public Input No. 3645-NFPA 70-2023 [New Part after III.] Public Input No. 3650-NFPA 70-2023 [New Part after III.]

Public Input No. 3654-NFPA 70-2023 [Section No. 820.93] Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]

Public Input Public Input	<u>No. 3661-NFPA 70-2023 [Section No. 830.93]</u> No. 3663-NFPA 70-2023 [Section No. 840.93]
Public Input	<u>No. 3666-NFPA 70-2023 [Section No. 840.94]</u>
Submitter Infe	ormation Verification
Submitter F	ull Name: Trevor Bowmer
Organizatio	n: Bunya Telecom Consulting, LLC
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Zip:	
Submittal Da	ate: Tue Sep 05 13:04:52 EDT 2023
Committee:	NEC-P16
Committee St	atement
<b>Resolution:</b>	FR-7773-NFPA 70-2024
Statement:	Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this expands 800.133 to include optical fiber cables. Cross references have been updated to Article 800 accordingly.



800.154 Applications of Listed Communications Wires, Cables, and Raceways, and Listed **Cable Routing Assemblies.** Permitted and nonpermitted applications of listed communications wires, cables, coaxial cables, network-powered broadband communications system 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 -Table 800.154(a) Applications of Listed Communications Wires, Cables, and Network-Powered Broadband Communications System Cables in Buildings Applications Wire and Cable Type Plenum Riser BMR General-Purpose BM Limited-Use Undercarpet BMU, BLU Hybrid Power and Communications Cables Communications Wires In ducts specifically fabricated for environmental air as described in 300.22(B) In fabricated ducts Y N N N N N N N N N In metal raceway that complies with 300.22(B) Y Y Y Y Y N N N Y In other spaces used for environmental air (plenums) as described in 300.22(C) In other spaces used for environmental air Y N N N N N N N N N In metal raceway that complies with 300.22(C) YYYYYY NNNY In plenum communications raceways Y N N N N N N N N N N In plenum cable routing assemblies Y N N N N N N N N N Supported by open metal cable trays Y N N N N N N N N N Supported by solid bottom metal cable trays with solid metal covers Y Y Y Y Y N N N In risers In vertical runs Y Y Y N N N N N N N In metal raceways Y Y Y Y N N N In fireproof shafts Y Y Y Y Y N N N In plenum communications raceways Y Y N N N N N N N N N N In plenum cable routing assemblies Y Y N N N N N N N N In riser communications raceways Y Y N N N N N N N N N In riser cable routing assemblies Y Y N N N N N N N N N n one- and two-family dwellings Y Y Y Y Y N N Y N Within buildings in other than air-handling spaces and risers General Y Y Y Y Y N N N N In one- and two-family dwellings YYYYY YYY NYN In multifamily dwellings YYYYY NNN In nonconcealed spaces Y Y Y Y Y N N N Supported by cable trays Y Y Y Y N N N N Under carpet, modular flooring, and planks NNNNNNNNN NN In distributing frames and crossconnect arrays Y Y N Y N N N N Y In rigid metal conduit (RMC) and intermediate metal conduit (IMC) Y Y Y Y Y Y Y Y Y H n any raceway recognized in Chapter 3 Y Y Y Y Y N N N Y In plenum communications raceways YYNYNNNNY In plenum cable routing assemblies Y Y N Y N N N N N Y In riser communications raceways Y Y N Y N N N N Y In riser cable routing assemblies Y Y N Y N N N N N Y In general-purpose communications raceways Y Y N Y N N N N N Y In general-purpose cable routing assemblies Y Y N Y N N N N N Y Note: An "N" in the table indicates that the cable type shall not be installed in the application. A "Y" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 800.113. The Riser column includes all riser cables except BMR, and the General-Purpose column includes all general-purpose cables except BM. Informational Note No. 1: Part IV of Article 800 covers installation methods within buildings. This table covers the applications of listed communications wires, cables, and raceways in buildings.

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 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 Supported by cable trays Y Y Under carpet, modular 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 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 In N In distributing N N N In general-purpose cable routing

Note: An "N" in the table indicates that the communications raceway type shall not 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(C) 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 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 In plenum communications raceways N N N In fireproof shafts Y Y In plenum communications raceways N N N In riser communications raceways N N N In one- and two-family dwellings Y Y Within buildings in other than air-handling spaces and risers General Y Y In one- and two-family dwellings Y Y In multifamily dwellings Y Y I In nonconcealed spaces Y Y Supported by cable trays Y Y Under carpet, modular flooring, and planks N N N In distributing frames and cross-connect arrays Y Y In any raceway recognized in Chapter 3 N N N In general-purpose communications raceways N N N In riser communications raceways N N N In distributing frames and cross-connect arrays Y Y N N In riser communications raceways N N N In Section 2000 (1000) (1000

Note: An "N" in the table indicates that the cable routing assembly type shall not 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.

**REPLACE 800.154 WITH THE TEXT IN THE ATTACHED FILE** 

#### **Additional Proposed Changes**

File NameDescriptionApprovedPl\_for\_800.154\_rev\_06222023.docx800.154 revision

#### Statement of Problem and Substantiation for Public Input

Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this PI expands the application requirements in 800.154 to include CATV-type coaxial cables, optical fiber cables, and network-powered broadband communications cables. It also moves the cable substitution hierarchies into the general article (Article 800) and establishes analogous cable substitution hierarchies for communications raceways and cable routing assemblies.

The TerraView program could not handle the changed text and figures. All the changes are shown in the attached Word doc.

# **Related Public Inputs for This Document**

Related Input Public Input No. 1174-NFPA 70-2023 [Section No. 805.154]

#### **Relationship**

Deletes the cable substitution requirements from Article.
Public Input No. 1173-NFPA 70-2023 [Sections

 Part V., 820.154]

 Public Input No. 1172-NFPA 70-2023 [Section

 No. 830.154]

 Public Input No. 1172-NFPA 70-2023 [Section

 No. 830.154]

 Public Input No. 1173-NFPA 70-2023 [Section

 No. 830.154]

 Public Input No. 1173-NFPA 70-2023 [Sections

 Part V., 820.154]

 Public Input No. 1174-NFPA 70-2023 [Section

 No. 805.154]

# **Submitter Information Verification**

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Committee:	NEC-P16

## **Committee Statement**

Resolution: FR-7780-NFPA 70-2024

**Statement:** Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this revision expands the application requirements in 800.154 to include CATV-type coaxial cables, optical fiber cables, and network-powered broadband communications cables. It also moves the cable substitution hierarchies into the general article (Article 800) and establishes analogous cable substitution hierarchies for communications raceways and cable routing assemblies.

Deletes the cable substitution requirements from Article.

Deletes the cable substitution requirements from Article.

800.154 Applications of Listed Communications Wires, and Cables, Listed Optical Fiber Cables, Listed CATV-Type Coaxial Cables, Listed Network-Powered Broadband Communications Cables, Listed Communications and Raceways, and Listed Cable Routing Assemblies. Permitted and nonpermitted applications of listed communications wires, cables, listed optical fiber cables, listed CATV-type coaxial cables, listed network-powered broadband communications system cables, listed communications-and raceways, and listed cable routing assemblies, shall be in accordance with one of the following:

(1)\_Listed communications wires, and cables; listed optical fiber cables; listed CATV-type coaxial cables, and listed network-powered broadband communications 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 permitted substitutions for listed communications cables, listed optical fiber cables, listed CATV-type coaxial cables, and listed network-powered broadband communications cables shall be in accordance with the following:

(1) Listed communications cables as indicated in Table 800.154(d) and Figure 800.154(d)

(2) Listed optical fiber cables as indicated in Table 800.154(e) and Figure 800.154(e)

(3) Listed CATV-type coaxial cables as indicated in Table 800.154(f) and Figure 800.154(f)

(4) Listed network-powered broadband cables as indicated in Table 800.154(g)

(5) Listed communications raceways as indicated in Table 800.154(h) and Figure 800.154(h)

(6) Listed cable routing assemblies as indicated in Table 800.154(i) and Figure 800.154(i)

Table 800.154(a) Applications of Listed Communications Wires, Cables, <u>Listed Optical Fiber Cables, Listed</u> <u>CATV-type coaxial cables,</u> and <u>Listed</u> Network-Powered Broadband Communications <u>System</u>-Cables in Buildings

	oleo in Bonan	95		_		_					
						m	Wire	and Cable	Туре	Hybrid Power	
				g	eneral-	L	imited-	Understand	BMU	and Communication	s Communicat
In ducts specifically	In fabricated ducts	Y	N	N	N	N	N	N	N	N	N
fabricated for environmenta air as	In metal raceway that	~									
described in 300.22(B)	complies with 300.22(B)	Y	1	1	Ţ	7	1	N	N	N	, Y
In other spaces used for	In other spaces used for environmental	Y	N	N	N	N	N	N	N	N	N
environmenta air (plenums) as described	I air In metal			+		$\vdash$					
in 300.22(C)	complies with 300 22(C)	Y	Y	Y	Y	Y	Y	N	N	N	Y
	In plenum communications raceways	Y	N	N	Ν	N	Ν	N	Ν	N	N
	In plenum cable routing	Y	N	N	Ν	N	N	N	N	N	N
	Supported by open metal	Y	N	N	N	N	N	N	N	N	N
	cable trays Supported by	10						2010	~		
	metal cable trays with solid	Y	Y	Y	Y	Y	Υ	N	Ν	N	N
In risers	In vertical runs	Y	Ŷ	Y	N	N	N	N	N	N	Ň
	In metal raceways	Y	Y	Y	Y	Y	Y	N	N	N	N
	shafts In plenum	X	Y	Y	Y	Y	Y	N	N	N	N
	communications raceways	Y	Y.	N	N	N	N	N	N	N	N
	routing assemblies	Y.	×.	.N.	N	N	N	N	N	N	N
	In riser communications raceways	Y	Y	N	Ν	N	Ν	N	Ν	N	N
	In riser cable routing	Y	Y	N	N	N	N	N	N	N	N
	In one- and two	Y	Y	Y	Y	Y	Y	N	N	Y	N
Within buildings in	General	Ŷ	Y	Y	Y	Y	Y	N	N	N	N
other than air handling spaces and	In one- and two family dwellings	Y	Y	Y	Y	Y	Y	Y	N	Y	N
nsers	dwellings	Y	Y	Y	Y	Y	Y	Y	N	N	N
	nonconcealed spaces	Y	Y	Y	Y	Y	Y	Y	N	N	N
	cable trays Under carpet.	Y	Y	Y	Y	Y	N	N	N	N	N
	modular flooring, and planks	Ν	N	N	Ν	N	Ν	Y	Ν	N	N
	In distributing frames and	Ŷ	Y	N	Y	N	N	N	N	N	Y
	cross-connect arrays	-	-								
	conduit (RMC) and intermediate	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	metal conduit (IMC)										
	In any raceway recognized in Chapter 3	Y	Y.	Y	Y	Y.	Y	0NE	Ν	N	Y
	In plenum communications	Y	. ¥.	N	Y	N	N	N	N	N	Y
	In plenum cable routing	Y	Y	N	Y	N	N	N	N	N	Y
	assemblies In riser	U.			- U				N.	N	
	raceways In riser cable										
	routing assemblies	Y	Y	N	Y	N	N	N	N	N	Y
	in general- purpose communications	Y	Y	N	Y	N	N	N	Ν	Ν	Y
	In general- purpose cable										
	routing assemblies	Y	Y	N	Y	N	N	N	N	N	Y
4											•
Note: An 'N' i in the applicat includes all or	the table indicate on subject to the I neral-purpose cab	s that the ca mitations de les except E	ble type si scribed in M.	hall not b 800.113.	tinstalled The Rise	l in the ap	pplication includes	A "Y" indicates all riser cables e	that the c except BN	able type shall be perm IR, and the General-Pu	itted to be installed rpose column
Informational	Vote No. 1. Part IV	of Article 80	0 covers i	rstallatio	n methods	s within b	uildings.1	This table cover	s the appi	lications of listed comm	unications wires,
capies, and ra	veways in building										

able 800.154(b) Applications of Listed Comm	unications Raceways in Buildings	Listed Co	ommunic Typ	ations Raceway e	800.154(b)
Applicat	tions	Plenum	Riser	General- Purpose	unchanged from the
In ducts specifically fabricated for environmental air as	In fabricated ducts	N	N	N	nom the
described in 300.22(B)	In metal raceway that complies with 300.22(B)	N	Ν	N	2023 NEC
n other spaces used for environmental air (plenums) as	In other spaces used for environmental air	Y	N	Ν	
described in 300.22(C)	In metal raceway that complies with 300.22(C)	Y	Y	Y	
	In plenum cable routing assemblies	N	N	Ν	
	Supported by open metal cable trays	Y	N	Ν	
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y	
n 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	General	Y	Y	Y	
risers	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, modular flooring, and planks	Ν	N	Ν	
	In distributing frames and cross-connect arrays	Y	Y	Y	
	In any raceway recognized in Chapter 3	Y	Y	Y	
	In plenum cable routing assemblies	N	Ν	N	
	In riser cable routing assemblies	N	N	Ν	
	In general-purpose cable routing assemblies	N	Ν	N	

		Listed Cable Routing Assembly Type			
Applicat	ions	Plenum	Riser	General- Purpose	
n ducts specifically fabricated for environmental air as	In fabricated ducts	N	N	Ν	
escribed in 300.22(B)	In metal raceway that complies with 300.22(B)	N	N	Ν	
other spaces used for environmental air (plenums) as	In other spaces used for environmental air	Y	N	Ν	
scribed in 300.22(C)	In metal raceway that complies with 300.22(C)	N	N	Ν	
	In plenum communications raceways	N	N	Ν	
	Supported by open metal cable trays	Y	N	Ν	
	Supported by solid bottom metal cable trays with solid metal covers	N	N	Ν	
risers	In vertical runs	Y	Y	Ν	
	In metal raceways	N	N	Ν	
	In fireproof shafts	Y	Y	Y	
	In plenum communications raceways	N	N	Ν	
	In riser communications raceways	N	N	Ν	
	In one- and two-family dwellings	Y	Y	Y	
ithin 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, modular flooring, and planks	N	N	Ν	
	In distributing frames and cross-connect arrays	Y	Y	Y	
	In any raceway recognized in Chapter 3	N	N	Ν	
	In plenum communications raceways	N	N	Ν	
	In riser communications raceways	N	N	Ν	
	In general-purpose communications raceways	N	N	N	

Cable	Type Permitted Substitutions
CMR	CMP
CMG, C	CM CMP, CMR
CMX	CMP, CMR, CMG, CM
Figure 80	0.154(d) Communications Cable Substitu





Table 800.154(f)	CATV-type Coaxial Cable Substitutions	Note- From 820,154.
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 800.154(f	CATV-type Coaxial Cable Substitution Hierarchy	Note- From
		820.154.



<u>Table 800.154(g</u>	) Network-Powered Broadband Cable S	Substitutions	Note- From
Cable Type	Permitted C	able Substitutions	830.154.
BM	BMR		
BLP	CMP, CL3P		
BLR	CMP, CL3P, CMR, CL3R, BLP, BMR		
BL	CMP, CMR, CM, CMG, CL3P, CL3R	, CL3, BMR, BM, BLP, BLR	
BLX	CMP, CMR, CM, CMG, CMX, CL3P,	CL3R, CL3, CL3X, BMR, BM, BLP, BRP, BL	
	Table 800.154(h) Listed Commu	nications Raceways Substitutions	
¥	Raceway Type	Permitted Substitutions	
Riser Commu	nications Raceway	Plenum Communications Raceway	
General-Purp	ose Communications Raceway	Plenum Communications Raceway, Riser	
		Communications Raceway	
Figure 800 154(	b) Listed Communications Pacaway	Substitution Hiorarchy	
<u>11gu10 000.134(</u>	n) Listed Communications Raceway	Substitution merarchy	







**800.154** Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies.

Permitted and nonpermitted applications of listed communications wires, cables, coaxial cables, network-powered broadband communications system 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.

Table 800.154(a) Applications of Listed Communications Wires, Cables, and Network-Powered Broadband Communications System Cables in Buildings

							Wire	and Cable Ty	<u>pe</u>
Appli	cations	<u>Plenum</u>	<u>Riser</u>	<u>BMR</u>	<u>General-</u> <u>Purpose</u>	<u>BM</u>	<u>Limited-</u> <u>Use</u>	<u>Undercarpet</u>	<u>BN</u> BI
In ducts specifically	In fabricated ducts	Y	N	N	Ν	Ν	N	Ν	٨
abricated for environmental air as described in 300.22(B)	In metal raceway that complies with 300.22(B)	Y	Y	Y	Y	Y	Y	N	Ν
	In other spaces used for environmental air	Y	N	N	Ν	Ν	Ν	Ν	٨
	In metal raceway that complies with 300.22(C)	Y	Y	Y	Y	Y	Y	Ν	٨
In other spaces used for	In plenum communications raceways	Y	N	N	Ν	N	Ν	Ν	Ν
air (plenums) as described in 300.22(C)	In plenum cable routing assemblies	Y	N	N	Ν	N	N	N	Ν
	Supported by open metal cable trays	Y	N	N	Ν	N	Ν	Ν	Ν
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y	Y	Y	Y	Ν	Ν
In risers	In vertical runs	Y	Y	Y	N	Ν	N	N	Ν
	In metal raceways	Y	Y	Y	Y	Y	Y	Ν	Ν
	In fireproof shafts	Y	Υ	Υ	Y	Y	Y	Ν	Ν
	In plenum communications raceways	Y	Y	Ν	Ν	N	Ν	Ν	N

					1		<u>Wire</u>	and Cable Ty	<u>pe</u>
<u>Appl</u>	ications	<u>Plenum</u>	<u>Riser</u>	BMR	<u>General-</u> Purpose	<u>BM</u>	<u>Limited-</u> <u>Use</u>	<u>Undercarpet</u>	BI B
	In plenum cable routing assemblies	Y	Y	N	N	N	N	Ν	1
	In riser communications raceways	Y	Y	N	N	N	Ν	Ν	
	In riser cable routing assemblies	Y	Y	N	N	N	Ν	Ν	
	In one- and two-family dwellings	Y	Y	Y	Y	Y	Y	Ν	
Within	General	Y	Y	Y	Y	Υ	Y	N	
other than air- handling	In one- and two-family dwellings	Y	Y	Y	Y	Y	Y	Y	
risers	In multifamily dwellings	Y	Y	Y	Y	Υ	Y	Y	
	In nonconcealed spaces	Y	Y	Y	Y	Y	Y	Y	
	Supported by cable trays	Y	Y	Y	Y	Y	N	N	
	Under carpet, modular flooring, and planks	N	N	N	N	N	N	Y	
	In distributing frames and cross-connect arrays	Y	Y	N	Y	N	N	N	
	In rigid metal conduit (RMC) and intermediate metal conduit (IMC)	Y	Y	Y	Y	Y	Y	Y	
	In any raceway recognized in Chapter 3	Y	Y	Y	Y	Y	Y	N	
	In plenum communications raceways	Y	Y	N	Y	N	N	Ν	
	In plenum cable routing assemblies	Y	Y	N	Y	N	Ν	Ν	
	In riser communications raceways	Y	Y	N	Y	N	N	N	

	_		1			· · · ·	<u>Wire</u>	and Cable Ty	<u>pe</u>
Application	<u>s</u>	Plenum	Riser	BMR	<u>General-</u> <u>Purpose</u>	<u>BM</u>	<u>Limited-</u> <u>Use</u>	<u>Undercarpet</u>	<u>BI</u> <u>B</u>
In rise routing assem	r cable ) Iblies	Y	Y	N	Y	N	Ν	Ν	
In gen purpos comm racewa	eral- se unications ays	Y	Y	N	Y	N	Ν	Ν	
In gen purpos routing assem	eral- se cable J Iblies	Y	Y	N	Y	N	Ν	Ν	
Note: An "N" in the ta "Y" indicates that the the limitations describ and the General-Purp	ble indicate cable type bed in 800. bose colum	es that the shall be 113. The n include	e cable permitte Riser c s all ge	type sl ed to bo olumn neral-p	hall not be e installed includes a ourpose ca	instal in the Il riser bles e	led in the applicatio cables ex except BM	application. A in subject to ccept BMR,	
Informational N methods within wires, cables, a	ote No. 1: buildings. and racewa	- <del>Part IV c</del> This table vs in buil	<del>of</del> <u>Artic</u> covers dings.	le 800 s the a	- <del>covers ,_</del> oplications	Part   of list	<u>V covers</u> ed commu	installation unications	
Informational N <u>for_restrictions</u> <del>800</del> . <del>113(B).</del>	ote No. 2: to the insta	- <del>For infor</del> allation of	<del>mation</del> comm	<del>on the</del> unicatio	restriction	<del>s <u>See</u> in fat</del>	<u>e 300.113(</u> pricated du	<u>B)</u> icts <del>, see</del>	
Table 800.154(b) Ap	plications o	f Listed C	Commu	nication	ns Racewa	iys in	Buildings		=
						<u>List</u>	ed Comm Raceway	<u>unications</u> y Type	
	<u>Applic</u>	<u>ations</u>				Plenu	m Riser	<u>General-</u> <u>Purpose</u>	
In ducts specifically fa	abricated	In fabrio	cated d	ucts		Ν	N	N	
for environmental air described in 300.22(E	as 3)	In meta complie	l racew s with 3	ay that 300.22	: (B)	Ν	N	N	
		In other environ	- spaces mental	s used air	for	Y	N	N	•
		In meta complie	l racew s with 3	ay that 300.22	(C)	Y	Y	Y	•
In other spaces used environmental air (ple	for enums) as	In plenu assemb	um cabl blies	e routii	ng	Ν	N	N	•
described in 300.22(0	C)	Suppor cable tr	ted by o ays	open m	ietal	Y	N	N	
		Suppor metal c metal c	ted by s able tra overs	solid bo ys with	ottom n solid	Y	Y	Y	
		In vortic					Y		
In risers		in veru	cal runs			Y		N	
In risers		In meta	l racew	ays		Y Y	Y	N Y	-
In risers		In meta In firepr	al runs I racew oof sha	ays ifts		Y Y Y	Y	N     Y     Y	-

		Listed Communications Raceway Type			
Applica	<u>tions</u>	<u>Plenum</u>	<u>Riser</u>	<u>General-</u> Purpose	
	In riser cable routing assemblies	Ν	N	Ν	
	In one- and two-family dwellings	Y	Y	Y	
	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, modular flooring, and planks	Ν	N	Ν	
Within buildings in other than air- handling spaces and risers	In distributing frames and cross-connect arrays	Y	Y	Y	
	In any raceway recognized in Chapter 3	Y	Υ	Y	
	In plenum cable routing assemblies	Ν	N	Ν	
	In riser cable routing assemblies	Ν	Ν	Ν	
	In general-purpose cable routing assemblies	N	N	N	

Note: An "N" in the table indicates that the communications raceway type shall not 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

		Liste As	d Cable sembly	Routing
Applic	ations	<u>Plenum</u>	<u>Riser</u>	<u>General-</u> Purpose
In ducts specifically fabricated	In fabricated ducts	N	Ν	Ν
for environmental air as described in 300.22(B)	In metal raceway that complies with 300.22(B)	N	N	Ν
	In other spaces used for environmental air	Y	N	Ν
	In metal raceway that complies with 300.22(C)	N	N	Ν
In other spaces used for environmental air (plenums) as	In plenum communications raceways	N	N	Ν
described in 300.22(C)	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	N	N	Ν
In risers	In vertical runs	Y	Y	Ν

		Listed Cable Routing Assembly Type		
Applic	cations	<u>Plenum</u>	<u>Riser</u>	<u>General-</u> Purpose
	In metal raceways	N	N	N
	In fireproof shafts	Y	Y	Y
	In plenum communications raceways	N	N	Ν
	In riser communications raceways	N	N	Ν
	In one- and two-family dwellings	Y	Y	Y
	General	Y	Y	Y
Within buildings in other than air-handling spaces and risers	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, modular flooring, and planks	N	N	Ν
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	N	N	Ν
	In plenum communications raceways	N	N	Ν
	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 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.

## Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Informational note 2 was revised to comply with the NEC Style Manual Section 2.1.10.3

## **Submitter Information Verification**

Submitter Full Name: David Williams

Organization: Delta Charter Township

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Submittal Date:	Mon Aug 28 13:27:38 EDT 2023
Committee:	NEC-P16

# **Committee Statement**

Resolution: <u>FR-7780-NFPA 70-2024</u>

**Statement:** Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this revision expands the application requirements in 800.154 to include CATV-type coaxial cables, optical fiber cables, and network-powered broadband communications cables. It also moves the cable substitution hierarchies into the general article (Article 800) and establishes analogous cable substitution hierarchies for communications raceways and cable routing assemblies.

# Public Input No. 26-NFPA 70-2023 [ Section No. 800.170 ]

800.170 Plenum Cable Ties.

Cable ties intended for use in other space used for environmental air (plenums) shall be listed as having low smoke and heat release properties.

Informational Note: See NFPA 90A<del>-2018</del>, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, and ANSI/UL 2043-2013 <u>8.5.5.6</u>, and UL 2043, *Standard for Safety-Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, for information on listing discrete products as having low smoke and heat release properties.

# Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A and the UL standard have been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 has been moved to 8.5.5.6 in the 2024 edition of NFPA 90A.

ANSI was stricken from the title of the UL reference to conform to current practice in references to UL standards.

## **Related Public Inputs for This Document**

**Related Input** 

Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]
Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]
Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]
Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]

### **Relationship**

Revise NFPA 90A reference Revise NFPA 90A reference

Public Input	<u>No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]</u>
Public Input	No. 27-NFPA 70-2023 [Section No. 800.182(A)]
Submitter Info	ormation Verification
Submitter F	ull Name: Stanley Kaufman
Organizatio	n: CableSafe, Inc./OFS
Affiliation:	Plastics Industry Association (PLASTICS)
Street Addre	ess:
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State:	
Zip:	
Submittal D	ate: Wed Jan 04 11:13:34 EST 2023
Committee:	NEC-P16
Committee St	tatement
<b>Resolution:</b>	<u>FR-7793-NFPA 70-2024</u>
Statement:	Per the NFPA manual of style the revision dates are being updated to the latest revision and the ANSI references are being deleted for consistency with other NFPA documents.

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Informati	onal Note No. 2: See ANSI/ATIS 0600337 <del>-2016</del> , <i>Requirements for Maximum</i>
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The title of the UL online catalog. The ibmitter Information: Submitter Full Na Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee Statem Resolution: FR-3	a trom the title of the UL reference to conform to current practice in references to U standard was revised to agree with the list of UL standards in the UL Standards e words "Standard for" have been dropped from the titles of UL standards. Ation Verification ame: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jun 20 08:16:31 EDT 2023 NEC-P16 nent 7796-NFPA 70-2024

Pub	lic Input No. 1157-NFPA 70-2023 [ Section No. 800.179 ]
RE	PLACE 800.
<del>179</del>	- <del>Wires and Cables.</del>
Con pow thro tem exco shal fibe	nmunications wires and cables, community antenna television cables, and network- ered broadband communications cables shall be listed in accordance with 800.179(A) ugh (L) and shall have a temperature rating of not less than 60°C (140°F). The perature rating shall be marked on the jacket of cables that have a temperature rating eeding 60°C (140°F). Conductors in communications cables, other than in a coaxial cable I be copper. Cables shall be permitted to contain optical fibers. Cables containing optical rs shall be marked with the suffix "-OF."
Con volta thar volta	nmunications wires and cables and network-powered communications cables shall have a age rating of not less than 300 volts; the insulation for the individual conductors, other I the outer conductor of a coaxial cable, shall be rated for 300 volts minimum. The cable age rating shall not be marked on the cable or on the under-carpet communications wire.
<del>Exe</del> <del>vol</del>	ception: Voltage markings shall be permitted where the cable has multiple listings and tage marking is required for one or more of the listings.
	Informational Note No. 1: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.
	Informational Note No. 2: See UL 444-2017, <i>Standard for Communications Cables</i> , for information on communications cables.
	Informational Note No. 3: See UL1655-2009, Standard for Community-Antenna Television Cables , for information on community-antenna television cables.
<del>(A)</del>	- <del>Plenum Cables.</del>
<del>Type plen plen usec smo</del>	CMP communications plenum cables, Type CATVP community antenna television um coaxial cables, and Type BLP network-powered broadband communication low-powe um cables shall be listed as being suitable for use in ducts, plenums, and other spaces I for environmental air and shall also be listed as having adequate fire-resistant and low- ke-producing characteristics.
	Informational Note: See NFPA 262-2019, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, for one method of defining a cable that is low-smoke-producing cable and fire-resistant cable so 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).
<del>(B)</del>	- <del>Riser Cables.</del>
<del>Type coax</del> <del>cable shall shall fire f</del>	CMR communications riser cables, Type CATVR community antenna television riser cial cables, Type BMR network-powered broadband communications medium-power riser es, and Type BLR network-powered broadband communications low-power riser cables be listed as being suitable for use in a vertical run in a shaft or from floor to floor and also be listed as having fire-resistant characteristics capable of preventing the carrying of rom floor to floor.
	Informational Note:- See ANSI/UL 1666-2017,- Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts, for one method of defining fire-resistant characteristics of the cable capable of preventing the carrying of fire from floor to floor.
<del>(C)</del>	- <del>General-Purpose Cables.</del>

#### (1) Type CMG.

Type CMG communications general-purpose 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: See CSA Vertical Flame Test — Cables in Cable Trays as described in CSA C22.2 No. 0.3-09 (R2019), *Test Methods for Electrical Wires and Cables*, for one method of defining resistance to the spread of fire where the damage (char length) of the cable does not exceed 1.5 m (4 ft 11 in.) or FT4 Flame Test in ANSI/UL 1685-2015, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test methods are not applicable.

(2) Types CM, CATV, BM, and BL.

Type CM communications general-purpose cables, Type CATV community antenna television coaxial general-purpose cables, Type BM network-powered broadband communications medium-power general-purpose cables, and Type BL network-powered broadband communications low-power general-purpose 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: See UL Flame Exposure in ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistance to the spread of fire where the damage (char length) of the cable does not to exceed 244 cm (8 ft 0 in.). The smoke measurements in the test method are not applicable.

(D) - Limited-Use Cables.

Type CMX limited-use communications cables, Type CATVX limited-use community antenna television coaxial cables, and Type BLX limited-use network-powered broadband low-power 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: See ANSI/UL 2556, Standard for Wire and Cable Test Method, for one method of determining that cable is resistant to flame spread is by testing the cable to the FV-2/VW-1 flame test.

(E) Circuit Integrity (CI) Cable, Fire-Resistive Cable System, 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(E)(1), (E)(2), or (E)(3).

#### (1) CI Cables.

Cables specified in 800.179(A) through (C) and used for survivability of critical circuits shall be marked with the additional classification using the suffix "CI." In order to maintain its listed fire rating, CI cable shall only be installed in free air in accordance with 800.24 . CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 800.179(E)(2).

Informational Note: See UL 2196, Standard for Fire Test for Circuit Integrity of Fire-Resistant Power, Instrumentation, Control, and Data Cables, for one method of defining CI cable by establishing a minimum 2-hour fire resistance rating for the cable as specified in UL 444, Standard for Safety Communications Cables.

#### (2) Fire-Resistive Cable Systems.

Cables specified in 800.179(A) -through (C) and 800.179(E)(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: See UL 2196, Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables, for one method of defining an electrical circuit protective system rating for the system. UL Guide Information for Electrical Circuit Integrity Systems (FHIT) -contains information to identify the system and its installation limitations to maintain a minimum fire-resistive rating.

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

(3) Electrical Circuit Protective System.

Protectants for cables specified in 800.179(A) through (E), which are part of an electrical circuit protective system, shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the system.

Informational Note: See UL 1724, *Fire Tests for Electrical Circuit Protective Systems*, for one method of defining an electrical circuit protective system. UL *Guide Information for Electrical Circuit Integrity Systems (FHIT)* -contains information to identify the system and its installation limitations to maintain the fire-resistive rating.

(F) 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) 23 AWG 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 amperes.

(G) 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: See ANSI/UL 2556, Standard for Wire and Cable Test Methods, for one method of determining that cable is resistant to flame spread in accordance with the FV-2/VW-1 flame test.

(H) 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 No. 1: See UL Flame Exposure, Vertical Flame Tray Test in ANSI/UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining-cable flame resistance to the spread of fire where the cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

Informational Note No. 2: See CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-09 (R2019), *Test Methods for Electrical Wires and Cables*, for another method of defining *resistance to the spread of fire* is for the damage (char length) of the cable to not exceed 1.5 m (4 ft 11 in.).

<del>(I)</del> – <del>Opti</del>	<del>onal Markings.</del>			
<del>Cables sl</del> <del>materials</del>	Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.			
Info limi	Informational Note: These markings can include, but are not limited to, markings for limited-smoke, halogen-free, low-smoke halogen-free, and sunlight resistance.			
<del>179 WIT</del>	<del>H THE TEXT AND</del>	FIGURES SHOWN	IN THE ATTACHED FILE	
Additional Proposed Changes				
File N	lame	<b>Description</b>	Approved	
800.179_revisions.docx 8 <sup>4</sup>		00.179 revisions		
Statement of	Problem and S	Substantiation fo	r Public Input	
Section 800.113 covers installation requirements for cables used for communications circuits. Table 800.113 is a list of those cables. In order to coordinate with Table 800.113, this PI expands the listing requirements in 800.179 to include optical fiber cables.				
The TerraVie the attached	w program could r Word doc.	not handle the change	ed text and figures. All the changes are shown in	
Submitter Inf	ormation Verifi	cation		
Submitter F	ull Name: Leslie Ju	utte		
Organizatio	n: Plastics	Industry Association		
Affiliation:	Plastics	Industry Association	(PLASTICS)	
Street Addre	ess:			
City:				
State:				
ZIP: Submittal D	ato: Wed lur	21 07·10·47 EDT 20	123	
Committee:	NEC-P1	6	720	
Committee Statement				
<b>Resolution:</b>	FR-7841-NFPA 7	0-2024		
Statement:	800.179 (A)-(I) ha have been include and tables which for referenced sta	es been revised to aliged ad in Article 800. Liste identify the marking of indards have been up	on with optical fiber cable type requirements that ad cables must be marked, so the requirements of cables have not been included. Revision dates odated per the NFPA manual of style.	

**800.179(A) Plenum Cables.** Type CMP communications plenum cables, <u>Types OFNP and OFCP</u> <u>nonconductive and conductive optical fiber plenum cables</u>, Type CATVP community antenna television plenum coaxial cables, and Type BLP network-powered broadband communication low-power 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: See NFPA 262-2019, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, for one method of defining a cable that is low-smoke-producing cable and fire-resistant cable so 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). **800.179(B) Riser Cables.** Type CMR communications riser cables, <u>Types OFNR and OFCR</u> <u>nonconductive and conductive optical fiber riser cables</u>. Type CATVR community antenna television riser cables, Type BMR network-powered broadband communications medium-power riser cables, and Type BLR network-powered broadband communications low-power 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 fireresistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See <u>ANSI/UL 1666-2017</u>, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*, for one method of defining fire-resistant characteristics of the cable capable of preventing the carrying of fire from floor to floor.

800.179(C) General-Purpose Cables.

**800.179(C)(1) Types CMG**, **OFNG and OFCG**. Type CMG communications general-purpose cables and <u>Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables</u>, 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: See CSA Vertical Flame Test — Cables in Cable Trays as described in CSA C22.2 No. 0.3-09 (R2019), *Test Methods for Electrical Wires and Cables*, for one method of defining resistance to the spread of fire where the damage (char length) of the cable does not exceed 1.5 m (4 ft

11 in.) or FT4 Flame Test in ANSI/UL 1685-2015, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test methods are not applicable.

**800.179(C)(2) Types CM, OFN, OFC, CATV, BM, and BL.** Type CM communications general-purpose cables, Types OFN and OFC nonconductive and conductive general-purpose optical fiber cables, Type CATV community antenna television coaxial general-purpose cables, Type BM network-powered broadband communications medium-power general-purpose cables, and Type BL network-powered broadband communications low-power general-purpose 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: See UL Flame Exposure in ANSI/UL 1685-2015, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for one method of defining *resistance to the spread of fire* where the damage (char length) of the cable does not to exceed 244 cm (8 ft 0 in.). The smoke measurements in the test method are not applicable.

**800.179(D)** Limited-Use Cables. Type CMX limited-use communications cables, Type CATVX limited-use community antenna television coaxial cables, and Type BLX limited-use network-powered broadband low-power 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: See <u>ANSI</u>/UL 2556, <u>Standard for</u> Wire and Cable Test Methods, for one method of determining that cable is resistant to flame spread is by testing the cable to the FV-2/VW-1 flame test.

**800.179(E)** Circuit Integrity (CI) Cable, Fire-Resistive Cable System, 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(E)(1), (E)(2), or (E)(3).

**800.179(E)(1) CI Cables.** Cables specified in 800.179(A) through (C) and used for survivability of critical circuits shall be marked with the additional classification using the suffix "CI." In order to maintain its listed fire rating, CI cable shall only be installed in free air in accordance with 800.24. CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 800.179(E)(2).

Informational Note: See UL 2196, *Standard for Fire Test for Circuit Integrity of Fire-Resistant Power, Instrumentation, Control, and Data Cables*, for one method of defining CI cable by establishing a

minimum 2-hour fire resistance rating for the cable as specified in UL 444, *Standard for Safety Communications Cables*.

**800.179(E)(2)** Fire-Resistive Cable Systems. Cables specified in 800.179(A) through (C) and 800.179(E)(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: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power*, *Instrumentation, Control and Data Cables*, for one method of defining an electrical circuit protective system rating for the system. UL *Guide Information for Electrical Circuit Integrity Systems (FHIT)* contains information to identify the system and its installation limitations to maintain a minimum fireresistive rating.

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

**800.179(E)(3) Electrical Circuit Protective System.** Protectants for cables specified in 800.179(A) through (E), which are part of an electrical circuit protective system, shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the system.

Informational Note: See UL 1724, *Fire Tests for Electrical Circuit Protective Systems*, for one method of defining an electrical circuit protective system. UL *Guide Information for Electrical Circuit Integrity Systems (FHIT)* contains information to identify the system and its installation limitations to maintain the fire-resistive rating.

**800.179(F) 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) 23 AWG 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 amperes.

**800.179(G) Field-Assembled Optical Fiber Cables.** Field-assembled optical fiber cable shall comply with the following:

- (1) The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the optical fiber cable types in 800.179(A), (B), or (D) and shall be marked in accordance with Table 800.179(I)(3).
- (2) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.
- (3) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.
- (4) The jacket without fibers shall meet the listing requirements for communications raceways in 800.182(A), (B), or (C) in accordance with the cable marking.

**800.179(GH)** 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: See <u>ANSI/UL 2556</u>, <u>Standard for</u> Wire and Cable Test Methods, for one method of determining that cable is resistant to flame spread in accordance with the FV-2/VW-1 flame test.

**800.179**(**H1**) **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 No. 1: See UL Flame Exposure, Vertical Flame Tray Test in ANSI/UL 1685-2015, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for one method of defining *cable flame resistance to the spread of fire* where the cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

Informational Note No. 2: See CSA Vertical Flame Test — Cables in Cable Trays, as described in CSA C22.2 No. 0.3-09 (R2019), *Test Methods for Electrical Wires and Cables*, for another method of defining *resistance to the spread of fire* is for the damage (char length) of the cable to not exceed 1.5 m (4 ft 11 in.). **800.179(J) Cable Marking**.

800.179(J)(1). Communications cables shall be marked in accordance with Table 800.179(I)(1).

Table 800.179(I)(1) C	Communications Cable Mar	king	_:
Cable Marking	Туре		-
CMP	Communications plenum	cable	-
CMR	Communications riser cab	ble	
CMG	Communications general-purpose cable		
CM	Communications general-purpose cable		
CMX	Communications cable, lin	nited use	
CMUC	Under-carpet communicat	tions wire and cable	
Cable Marking	j Type	<u>.</u>	
CATVP	CATV plenum cable		
CATVR	CATV riser cable		
CATV	CATV cable		
CATVX	CATV cable, limited use		
		).	
<b>800.179(J)(3).</b> Optica Table 800.179(I)(3) (	ll fiber cables shall be mark Optical Fiber Cable Marking	ed in accordance with	h Table 800.179(I)(3).

Cable Marking	Туре
OFNP	Nonconductive optical fiber plenum cable
OFCP	Conductive optical fiber plenum cable
OFNR	Nonconductive optical fiber riser cable
OFCR	Conductive optical fiber riser cable
OFNG	Nonconductive optical fiber general-purpose cable
OFCG	Conductive optical fiber general-purpose cable
OFN	Nonconductive optical fiber general-purpose cable
OFC	Conductive optical fiber general purpose cable

Informational Note: These markings can include, but are not limited to, markings for limited-smoke, halogen-free, low-smoke halogen-free, and sunlight resistance.

**800.182(C) General-Purpose Cable Routing Assemblies and General-Purpose 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: See ANSI/UL 1685-2015, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for one method of defining resistance to the spread of fire where the cable routing assemblies and communications raceways do not spread fire to the top of the tray.

(A) Plenum C	ables.
Type CMP con coaxial cables, cables shall be environmental producing cha	nmunications plenum cables, Type CATVP community antenna television plenum and Type BLP network-powered broadband communication low-power plenum listed as being suitable for use in ducts, plenums, and other spaces used for air and shall also be listed as having adequate fire-resistant and low-smoke- racteristics.
Informati Smoke o cable tha exhibits a 0.15 or le	onal Note: See NFPA 262 <del>-2019</del> , <i>Standard Method of Test for Flame Travel and of Wires and Cables for Use in Air-Handling Spaces</i> , for one method of defining a statis low-smoke-producing cable and fire-resistant cable so that the cable a maximum peak optical density of 0.50 or less, an average optical density of ess, and a maximum flame spread distance of 1.52 m (5 ft).
The edition date for	۔ or the NFPA standard has been deleted because it is not needed. Section 90.5(C) ir
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as the latest edition Ibmitter Information: Submitter Full Nation: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee Stater Resolution: FR- Statement: 800. have	tes "Unless the standard reference includes a date, the reference is to be considered on of the standard." ation Verification ame: David Kiddoo CCCA Communications Cable & Connectivity Association Mon May 29 15:07:40 EDT 2023 NEC-P16 nent 7841-NFPA 70-2024 179 (A)-(I) has been revised to align with optical fiber cable type requirements that been included in Article 800. Listed cables must be marked, so the requirements

# Public Input No. 905-NFPA 70-2023 [ Section No. 800.179 [Excluding any Sub-NFPA Sections] ]

Communications wires and cables, community antenna television cables, and network-powered broadband communications cables shall be listed in accordance with 800.179(A) through (L) and 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). Conductors in communications cables, other than in a coaxial cable, shall be copper. Cables shall be permitted to contain optical fibers. Cables containing optical fibers shall be marked with the suffix "-OF."

Communications wires and cables and network-powered communications 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 under-carpet communications wire.

*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 No. 1: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.

Informational Note No. 2: See UL 444 -2017, Standard for Communications Cables, for information on communications cables.

Informational Note No. 3: See UL1655 -2009, Standard for Community-Antenna Television Cables, for information on community-antenna television cables.

## Statement of Problem and Substantiation for Public Input

The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

ANSI was stricken from the title of the UL reference to conform to current practice in references to UL standards.

The title of the UL standard was revised to agree with the list of UL standards in the UL Standards online catalog. The words "Standard for" have been dropped from the titles of UL standards.

## **Submitter Information Verification**

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Submittal Date:	Mon May 29 15:03:18 EDT 2023
Committee:	NEC-P16

## **Committee Statement**
Resolution: FR-7800-NFPA 70-2024

**Statement:** Per the NFPA manual of style the revision dates are being updated to the latest revision and revised UL titles for consistency with other NFPA documents.





	ble Routing Assemblies and Plenum Communications Raceways.
Plenum cable ro having adequate	outing assemblies and plenum communications raceways shall be listed as a fire-resistant and low-smoke-producing characteristics.
Information Burning Co Method for defining ca fire-resista spread ind	nal Note No. 1: See ASTM E84- <del>19B</del> <u>23a</u> , <i>Standard Test Method for Surface haracteristics of Building Materials</i> , or ANSI/UL 723-2018, <i>Standard Test r Surface Burning Characteristics of Building Materials</i> , for one method of able routing assemblies and communications raceways that have adequate ant and low-smoke-producing characteristics and exhibit a maximum flame lex of 25 and a maximum smoke developed index of 50.
Information and Smok defining co producing average o (5 ft) or les	nal Note No. 2: See NFPA 262-2019, <i>Standard Method of Test for Flame Trave of Wires and Cables for Use in Air-Handling Spaces</i> , for another method of communications raceways that have adequate fire-resistant and low-smoke-characteristics and exhibit a maximum peak optical density of 0.50 or less, and ptical density of 0.15 or less, and a maximum flame spread distance of 1.52 mass.
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Public Input No. 27-NFPA 70-2023 [ Section No. 800.	.182(A) ]
(A) Plenum Cable Routing Assemblies and Plenum Communicat	tions Raceways.
Plenum cable routing assemblies and plenum communications rachaving adequate fire-resistant and low-smoke-producing character	ceways shall be listed as eristics.
Informational Note No. 1: See ASTM E84 <del>-19B</del> , <i>Standard Te</i> <i>Burning Characteristics of Building Materials</i> , or <del>ANSI/</del> UL 7 <i>Method for Surface Burning Characteristics of Building Mate</i> defining cable routing assemblies and communications race fire-resistant and low-smoke-producing characteristics and e spread index of 25 and a maximum smoke developed index	est Method for Surface 723 <del>-2018</del> , <del>Standard</del> Test erials, for one method of eways that have adequate exhibit a maximum flame < of 50.
Informational Note No. 2: See NFPA 262 <del>-2019</del> , <i>Standard M. Travel and Smoke of Wires and Cables for Use in Air-Handl.</i> method of defining communications raceways that have ade smoke-producing characteristics and exhibit a maximum pe less, an average optical density of 0.15 or less, and a maxir 1.52 m (5 ft) or less.	<i>lethod of Test for Flame</i> <i>ling Spaces</i> , for another equate fire-resistant and low- ak optical density of 0.50 or mum flame spread distance of
Informational Note No. 3: See <del>4.3.11.2.6 or 4.3.11.5.5 of</del> NF the Installation of Air-Conditioning and Ventilating Systems, <u>Optical Fiber Wiring and Equipment in Plenums and Ducts</u> exposed to the airflow in ceiling cavity and raised floor plenu	FPA 90A <del>-2021</del> , <i>Standard for</i> <u>Chapter 10, Electrical and</u> for information on materials ums.
The edition dates the standards have been deleted because They are the 2023 NEC states "Unless the standard reference includes a date, as the latest edition of the standard." The current edition of NFPA 90A, the 2024 edition, has been significated editions, electrical requirements for installation in ducts and plenums Systems. The 2024 edition has a new Chapter 10, Electrical and Opt in Plenums and Ducts. Consequently, Informational Notes referencing 90A need to be revised.	e not needed. Section 90.5(C) in , the reference is to be consider antly reorganized. In previous were in Chapter 4, HVAC ical Fiber Wiring and Equipmen g electrical requirements in NFF
ANSI was stricken from the title of the UL reference to conform to cur standards.	rrent practice in references to U
ated Public Inputs for This Document	
Related Input         Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]         Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]         Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]         Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]         Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]         Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]         Public Input No. 21 NEPA 70 2022 [Section No. 770.113(B)(2)]	Revise NFPA 90A reference Revise NFPA 90A reference
Public input No. 21-NFPA /0-2023 [Section No. //0.113(C)(2)]	Revise NEPA 90A reference

# **Submitter Information Verification**

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Submittal Date:	Wed Jan 04 11:18:11 EST 2023		
Committee:	NEC-P16		

# **Committee Statement**

**Resolution:** <u>FR-7802-NFPA 70-2024</u> **Statement:** Per the NFPA manual of style the revision dates are being updated to the latest revisions.

Revise NFPA 90A reference Revise NFPA 90A reference Revise NFPA 90A reference

(B) Riser Cable	e Routing Assemblies and Riser Communications Raceways.
Riser cable routi adequate fire-res floor.	ng assemblies and riser communications raceways shall be listed as having sistant characteristics capable of preventing the carrying of fire from floor to
Information Height of E of defining floor to floo	nal Note: See ANSI/ UL 1666 -2017, Standard Test for Flame Propagation Electrical and Optical-Fiber Cable Installed Vertically in Shafts, for one method fire-resistant characteristics capable of preventing the carrying of fire from or of the cable routing assemblies and communications raceways.
atement of Probl	em and Substantiation for Public Input
The edition date for 2023 NEC states "L the latest edition of	the UL standard has been deleted because it is not needed. Section 90.5(C) ir Jnless the standard reference includes a date, the reference is to be considered the standard."
ANSI was stricken f standards.	rom the title of the UL reference to conform to current practice in references to
The title of the UL s online catalog. The	tandard was revised to agree with the list of UL standards in the UL Standards words "Standard for" have been dropped from the titles of UL standards.
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bmitter Informat Submitter Full Nan Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee Stateme	tion Verification ne: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jun 20 06:24:40 EDT 2023 NEC-P16 ent
bmitter Informat Submitter Full Nan Organization: Affiliation: Street Address: City: State: Zip: Submittal Date: Committee: mmittee Stateme Resolution: FR-78	tion Verification ne: Leslie Jutte Plastics Industry Association Plastics Industry Association (PLASTICS) Tue Jun 20 06:24:40 EDT 2023 NEC-P16 ent 802-NFPA 70-2024

General-purpose cable routing assemblies and general-purpose communications raceways shall be listed as being resistant to the spread of fire.         Informational Note: See ANSH UL 1685-2015, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistance to the spread of fire where the cable routing assemblies and communications raceways do not spread fire to the top of the tray.         tatement of Problem and Substantiation for Public Input         The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in 12023 NEC states "Unless the standard reference includes a date, the reference is to be considered the latest edition of the standard."         ANSI was stricken from the title of the UL reference to conform to current practice in references to U standards.         The title of the UL standard for" have been dropped from the titles of UL standards.         ubmitter Information Verification         Submitter Full Name: Leslie Jutte         Organization:       Plastics Industry Association (PLASTICS)         Street Address:         City:         State:       Zip:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee Statement       NEC-P16	General-purpose shall be listed as I Informationa <i>Propagatior</i> method of d and commu tatement of Proble	cable routing assemblies and general-purpose communications raceways being resistant to the spread of fire. al Note: See <del>ANSI/</del> UL 1685 <del>-2015</del> , <i>Standard for Safety for Vertical-Tray Fire-</i> <i>n and Smoke-Release Test for Electrical and Optical-Fiber Cables</i> , for one lefining resistance to the spread of fire where the cable routing assemblies nications raceways do not spread fire to the top of the tray.
Informational Note: See ANSH UL 1685-2015, Standard for Safety for Vertical-Tray Fire- Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one method of defining resistance to the spread of fire where the cable routing assemblies and communications raceways do not spread fire to the top of the tray. Externent of Problem and Substantiation for Public Input The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in 1 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered the latest edition of the standard." ANSI was stricken from the title of the UL reference to conform to current practice in references to U standards. The title of the UL standard was revised to agree with the list of UL standards in the UL Standards online catalog. The words "Standard for" have been dropped from the titles of UL standards. Lubmitter Information Verification Submitter Full Name: Leslie Jutte Organization: Plastics Industry Association Affiliation: Plastics Industry Association (PLASTICS) Street Address: City: State: Zip: Submittal Date: Tue Jun 20 06:20:04 EDT 2023 Committee Statement	Informationa Propagation method of d and commu catement of Proble The edition date for th	al Note: See ANSI/ UL 1685-2015, Standard for Safety for Vertical-Tray Fire- and Smoke-Release Test for Electrical and Optical-Fiber Cables, for one lefining resistance to the spread of fire where the cable routing assemblies nications raceways do not spread fire to the top of the tray.
catement of Problem and Substantiation for Public Input         The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in 12023 NEC states "Unless the standard reference includes a date, the reference is to be considered the latest edition of the standard."         ANSI was stricken from the title of the UL reference to conform to current practice in references to U standards.         The title of the UL standard was revised to agree with the list of UL standards in the UL Standards online catalog. The words "Standard for" have been dropped from the titles of UL standards.         Aubmitter Information Verification         Submitter Full Name: Leslie Jutte         Organization:       Plastics Industry Association         Affiliation:       Plastics Industry Association (PLASTICS)         Street Address:       City:         State:       Zip:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee Statement       NEC-P16	The edition date for the	m and Substantiation for Public Input
The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in a 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered the latest edition of the standard." ANSI was stricken from the title of the UL reference to conform to current practice in references to U standards. The title of the UL standard was revised to agree with the list of UL standards in the UL Standards online catalog. The words "Standard for" have been dropped from the titles of UL standards. <b>Ubmitter Information Verification</b> Submitter Full Name: Leslie Jutte Organization: Plastics Industry Association Affiliation: Plastics Industry Association (PLASTICS) Street Address: City: State: Zip: Submittal Date: Tue Jun 20 06:20:04 EDT 2023 Committee Statement	The edition date for the	in and Substantiation for Fubic input
ANSI was stricken from the title of the UL reference to conform to current practice in references to U standards. The title of the UL standard was revised to agree with the list of UL standards in the UL Standards online catalog. The words "Standard for" have been dropped from the titles of UL standards. Ubmitter Information Verification Submitter Full Name: Leslie Jutte Organization: Plastics Industry Association Affiliation: Plastics Industry Association (PLASTICS) Street Address: City: State: Zip: Submittal Date: Tue Jun 20 06:20:04 EDT 2023 Committee Statement	2023 NEC states "Un the latest edition of th	he UL standard has been deleted because it is not needed. Section 90.5(C) in tabless the standard reference includes a date, the reference is to be considered ane standard."
The title of the UL standard was revised to agree with the list of UL standards in the UL Standards. Abmitter Information Verification Submitter Full Name: Leslie Jutte Organization: Plastics Industry Association Affiliation: Plastics Industry Association (PLASTICS) Street Address: City: State: Zip: Submittal Date: Tue Jun 20 06:20:04 EDT 2023 Committee Statement:	ANSI was stricken fro standards.	om the title of the UL reference to conform to current practice in references to U
Submitter Information       Verification         Submitter Full Name: Leslie Jutte         Organization:       Plastics Industry Association         Affiliation:       Plastics Industry Association (PLASTICS)         Street Address:       Image: City:         State:       Image: City:         State:       Image: City:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee Statement:       NEC-P16	The title of the UL sta online catalog. The w	andard was revised to agree with the list of UL standards in the UL Standards vords "Standard for" have been dropped from the titles of UL standards.
Submitter Full Name: Leslie JutteOrganization:Plastics Industry AssociationAffiliation:Plastics Industry Association (PLASTICS)Street Address:	Ibmitter Informatio	on Verification
Organization:Plastics Industry AssociationAffiliation:Plastics Industry Association (PLASTICS)Street Address:Plastics Industry Association (PLASTICS)City:State:State:Plastics Industry Association (PLASTICS)State:Plastics Industry Association (PLASTICS)State: <td>Submitter Full Name</td> <td>e: Leslie Jutte</td>	Submitter Full Name	e: Leslie Jutte
Affiliation:       Plastics Industry Association (PLASTICS)         Street Address:       City:         City:       State:         Zip:       Submittal Date:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee       NEC-P16	Organization:	Plastics Industry Association
Street Address:         City:         State:         Zip:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee:       NEC-P16	Affiliation:	Plastics Industry Association (PLASTICS)
State:         Zip:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee:       NEC-P16	Street Address: City:	
Zip:         Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee:       NEC-P16	State:	
Submittal Date:       Tue Jun 20 06:20:04 EDT 2023         Committee:       NEC-P16         Committee Statement       Statement	Zip:	
Committee: NEC-P16 ommittee Statement	Submittal Date:	Tue Jun 20 06:20:04 EDT 2023
ommittee Statement	Committee:	NEC-P16
	ommittee Stateme	nt

# Public Input No. 1140-NFPA 70-2023 [ Section No. 800.182 [Excluding any NFPA Sub-Sections] ]

Cable routing assemblies and communications raceways shall be listed in accordance with 800.182(A) through (C). Cable routing assemblies shall be marked in accordance with Table 800.182(a). Communications raceways shall be marked in accordance with Table 800.182(b).

Informational Note: See ANSI/ UL 2024-5-2015, Cable Routing Assemblies and Communications Raceways, for information on listing requirements for both communications raceways and cable routing assemblies.

Table 800.182(a) Cable Routing Assembly Markings

Туре	Marking
Plenum Cable Routing Assembly	Plenum Cable Routing Assembly
Riser Cable Routing Assembly	Riser Cable Routing Assembly
General-Purpose Cable Routing Assembly	General-Purpose Cable Routing Assembly
Table 800.182(b) Communications Raceway	Markings
<u>Type</u>	<u>Marking</u>
Plenum Communications Raceway	Plenum Communications Raceway
Riser Communications Raceway	Riser Communications Raceway
General-Purpose Communications Raceway	General-Purpose Communications Raceway

## **Statement of Problem and Substantiation for Public Input**

The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states "Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard."

ANSI was stricken from the title of the UL reference to conform to current practice in references to UL standards.

## **Submitter Information Verification**

Submitter Full Name: Leslie Jutte			
Organization:	Plastics Industry Association		
Affiliation:	Plastics Industry Association (PLASTICS)		
Street Address:			
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Submittal Date:	Tue Jun 20 06:29:11 EDT 2023		
Committee:	NEC-P16		

### **Committee Statement**

Resolution: FR-7802-NFPA 70-2024

Statement: Per the NFPA manual of style the revision dates are being updated to the latest revisions.

Public Input I	No. 1183-NFPA 70-2023 [ Section No. 8	05.18 ]
NFPA		
805.18 Installa	<del>tion of Equipment.</del>	
<del>Equipment elect</del> <del>with 800.171 .</del>	rically connected to a communications network s	hall be listed in accordance
Exception:- This temporary conr of installation, r	s listing requirement shall not apply to test equipr nection to a telecommunications network by quali naintenance, or repair of telecommunications equ	nent that is intended for fied persons during the course upment or systems.
Statement of Probl	em and Substantiation for Public Inpu	t
The requirement to (Article 800).	use listed equipment is a general requirement ar	nd should be in the general Article
Related Public Inp	uts for This Document	
	Related Input	<b>Relationship</b>
Public Input No. 11	82-NFPA 70-2023 [New Section after 800.3]	Moves 805.18 to Article 800
Public Input No. 11	82-NFPA 70-2023 [New Section after 800.3]	
Submitter Informat	ion Verification	
Submitter Full Nan	ne: Leslie Jutte	
Organization:	Plastics Industry Association	
Affiliation:	Plastics Industry Association (PLASTICS)	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Thu Jun 22 12:01:55 EDT 2023	
Committee:	NEC-P16	
Committee Statem	ent	
Resolution: <u>F</u> R-75	52-NFPA 70-2024	
Statement: The ret to Sec	equirement to use listed equipment is a general re action 800.2. This aligns with the NFPA manual of s	equirement and has been moved style.

Public Ir	nput No. 3344-NFPA 70-2	023 [ Section No. 805.50(C)(3)	]
NFPA			
(3) Servi	ice Head.		
Raceway wire and <del>other met</del>	s shall be equipped with an app cable shall be permitted to enter t <del>al raceways located ahead of th</del>	roved service head. More than one cor r through a single raceway or bushing ne primary protector shall be grounded.	mmunications <del>Conduits or</del> -
Additional Pro	oposed Changes		
	File Name	<b>Description</b>	Approved
Limited_Ene	ergy_TG_Substantiation.docx	Limited Energy TG Chair Substantiation	
Statement of	Problem and Substantiat	ion for Public Input	
As part of the Limited Ener	e work by the Limited Energy TC gy Grounding, Bonding, and Pri	G, the section is deleted as it is relocate mary Protective Article.	ed into the new
Related Publi	c Inputs for This Docume	ent	
Public Input	Related Input	Relationship	
Submitter Info	ormation Verification	<u></u> j	
Submitter F	ull Name: Derrick Atkins		
Organizatio	n: Minneapolis Electrica	IJATC	
Street Addre	ess:		
State:			
Zip:			
Submittal Da	ate: Fri Sep 01 14:07:02 E	EDT 2023	
Committee:	NEC-P16		
Committee St	atement		
Resolution:	For clarity, ease-of-use, and av requirements as practical for co 805 rather to separate these tw and X050).	roiding confusion it is more appropriate ommunications systems explicitly in on vo related rules and sentences into diffe	to have as many e article such as erent articles (805

Sections	<del>805.90, 805.93</del>
<del>805.90</del> F	Protective Devices.
(A) Appl	ication.
A listed p aerial cat each circu to be exp 300 volts circuit on interbuild	rimary protector shall be provided on each circuit run partly or entirely in aerial wire of the not confined within a block. Also, a listed primary protector shall be provided on uit, aerial or underground, located within the block containing the building served so osed to accidental contact with electric light or power conductors operating at over to ground. In addition, where there exists a lightning exposure, each interbuilding a premises shall be protected by a listed primary protector at each end of the ing circuit. Installation of primary protectors shall also comply with 110.3(B).
<del>Infe con proi faul</del>	prmational Note No. 1: On a circuit not exposed to accidental contact with power iductors, providing a listed primary protector in accordance with this article helps tect against other hazards, such as lightning and above-normal voltages induced b It currents on power circuits in proximity to the communications circuit.
<del>Infe</del> exp	rmational Note No. 2: Interbuilding circuits are considered to have a lightning posure 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 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 <del>coast.</del>
<del>Info</del> Pro	rmational Note No. 3: See NFPA 780-2020, Standard for the Installation of Lightn tection Systems, for information on lightning protection systems.

#### (1) Fuseless Primary Protectors.

Fuseless-type primary protectors shall be permitted under any of the following conditions:

- (1) Where conductors enter a building through a cable with grounded metallic sheath member(s) and where the conductors in the cable safely fuse on all currents greater than the current-carrying capacity of the primary protector and of the primary protector bonding conductor or grounding electrode conductor
- (2) Where insulated conductors in accordance with 805.50(A) are used to extend circuits to a building from a cable with an effectively grounded metallic sheath member(s) and where the conductors in the cable or cable stub, or the connections between the insulated conductors and the plant exposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground, safely fuse on all currents greater than the current-carrying capacity of the primary protector, or the associated insulated conductors and of the primary protector bonding conductor or grounding electrode conductor
- (3) Where insulated conductors in accordance with 805.50(A) or (B) are used to extend circuits to a building from other than a cable with metallic sheath member(s), where (a) the primary protector is listed as being suitable for this purpose for application with circuits extending from other than a cable with metallic sheath members and (b) the connections of the insulated conductors to the plant exposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground or the conductors operating at greater than 300 volts to ground or the currents at greater than 300 volts to ground or the current-carrying capacity of the primary protector, or associated insulated conductors and of the primary protector bonding conductor or grounding electrode conductor
- (4) Where insulated conductors in accordance with 805.50(A) are used to extend circuits aerially to a building from a buried or underground circuit that is unexposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground
- (5) Where insulated conductors in accordance with 805.50(A) are used to extend circuits to a building from cable with an effectively grounded metallic sheath member(s), and where (a) the combination of the primary protector and insulated conductors is listed as being suitable for this purpose for application with circuits extending from a cable with an effectively grounded metallic sheath member(s) and (b) the insulated conductors safely fuse on all currents greater than the current-carrying capacity of the primary protector and of the primary protector or grounding electrode conductor

Informational Note: See ANSI/IEEE C2-2017, National Electrical Safety Code, Section 9, for examples of methods of protective grounding that can achieve effective grounding of communications cable sheaths for cables from which communications circuits are extended.

#### (2) Fused Primary Protectors.

Where the requirements listed under 805.90(A)(1) (a) through (A)(1)(e) are not met, fused-type primary protectors shall be used. Fused-type primary protectors shall consist of an arrester connected between each line conductor and ground, a fuse in series with each line conductor, and an appropriate mounting arrangement. Primary protector terminals shall be marked to indicate line, instrument, and ground, as applicable.

# National Fire Protection Association Report (B) Location. The primary protector shall be located in, on, or immediately adjacent to the structure or building served and as close as practicable to the point of entrance. For purposes of this section, primary protectors located at mobile home service equipment within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means connected to an electrode by a grounding electrode conductor in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section. Informational Note: Selecting a primary protector location to achieve the shortest practicable primary protector bonding conductor or grounding electrode conductor helps limit potential differences between communications circuits and other metallic systems. (C) Hazardous (Classified) Locations. The primary protector shall not be located in any hazardous (classified) locations, as defined in 500.5 - and 505.5 , or in the vicinity of easily ignitible material. Exception: As permitted in 501.150 , 502.150 , and 503.150 . (D) Secondary Protectors. Where a secondary protector is installed in series with the indoor communications wire and cable between the primary protector and the equipment, it shall be listed for the purpose in accordance with 805.170(B). Informational Note: Secondary protectors on circuits exposed to accidental contact with electric light or power conductors operating at greater than 300 volts to ground are not intended for use without primary protectors. 805.93 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 805.93(A) or (B). (A) Entering Buildings. In installations where the communications cable enters a building, the metallic sheath members of the cable shall be 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 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. Additional Proposed Changes **File Name** Description Approved Limited Energy TG Chair Limited\_Energy\_TG\_Substantiation.docx Substantiation Statement of Problem and Substantiation for Public Input

As part of the work by the Limited Energy TG, the section is deleted as it is relocated into the new Limited Energy Grounding, Bonding, and Primary Protective Article.

### Submitter Information Verification

Submitter Full Name: Derrick Atkins

Submittal Date:Fri Sep 01 14:08:37 EDT 2023Committee:NEC-P16Committee StatementResolution:For clarity, ease-of-use, and usability it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, Pi-3654, Pi-3660, PI-3661, PI-3663, PI-3666, and Pi-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93	Organization Street Addres City: State: Zip:	: Minneapolis Electrical JATC ss:
Committee:NEC-P16Committee StatementResolution:For clarity, ease-of-use, and usability it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, Pi-3654, Pi-3660, PI-3661, PI-3663, PI-3666, and Pi-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93	Submittal Da	te: Fri Sep 01 14:08:37 EDT 2023
<b>Committee Statement</b> <b>Resolution:</b> For clarity, ease-of-use, and usability it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, Pi-3654, Pi-3660, PI-3661, PI-3663, PI-3666, and Pi-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93	Committee:	NEC-P16
<b>Resolution:</b> For clarity, ease-of-use, and usability it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, Pi-3654, Pi-3660, PI-3661, PI-3663, PI-3666, and Pi-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93	Committee Sta	atement
	Resolution:	For clarity, ease-of-use, and usability it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 800. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, Pi-3654, Pi-3660, PI-3661, PI-3663, PI-3666, and Pi-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93

Public Input	No. 1188-NFPA 70-2023	[ Section No. 805.93 ]
<del>805.93</del> - Grou Members of C	nding, Bonding, or Interruption o	of Non–Current-Carrying Metallic Sheath
Communication	ons cables entering the building <del>05.93(A) -or (B).</del>	or terminating on the outside of the building shall
(A) Entering	<del>Buildings.</del>	
In installations of the cable sh insulating joint practicable to	where the communications cat all be grounded or bonded as s or equivalent device. The grou the point of entrance.	v <del>le enters a building, the metallic sheath members</del> <del>pecified in 800.100 or interrupted by an</del> <del>nding, bonding, or interruption shall be as close as</del>
<del>(B)</del> <del>Terminati</del>	ng on the Outside of Buildings.	
In installations metallic sheath interrupted by shall be as clo	where the communications cab n members of the cable shall be an insulating joint or equivalent se as practicable to the point of	He is terminated on the outside of the building, the grounded or bonded as specified in 800.100 or device. The grounding, bonding, or interruption termination of the cable.
These requiremen	nts are moved to the general Art puts for This Document	icle by PI 1187
Public Input No. Section after 800 Public Input No. Section after 800	<u>Related Input</u> <u>1187-NFPA 70-2023 [New</u> <u>.53]</u> <u>1187-NFPA 70-2023 [New</u> <u>.53]</u>	<u>Relationship</u> Consolidates grounding, bonding requirements in Article 800
Submitter Information	ation Verification	
Submitter Full Na	ame: Leslie Jutte	
Organization:	Plastics Industry Associati	on
Affiliation: Street Address: City: State: Zin:	Plastics Industry Associati	on (PLASTICS)
Zip. Submittal Data:	Thu Jup 22 12:56:21 EDT	2023
Committee:	NEC-P16	2020
Committee Stater	nent	
Resolution: <u>FR-</u> Statement: The requ	7770-NFPA 70-2024 committee has created new sec irements for grounding, bonding	ction 800.93 which consolidates the common g, and interruption. This revision removes this section

to align with this consolidation effort.



Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]
Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]
Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]
Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]
Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub- Sections]]
Public Input No. 3645-NFPA 70-2023 [New Part after III.]
Public Input No. 3650-NFPA 70-2023 [New Part after III.]
Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]
Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]
Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]
Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]
Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub- Sections]]

# **Submitter Information Verification**

Submitter Full Name:	Trevor Bowmer
Organization:	Bunya Telecom Consulting, LLC
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Sep 05 12:29:51 EDT 2023
Committee:	NEC-P16

### **Committee Statement**

Resolution: FR-7770-NFPA 70-2024

**Statement:** The committee has created new section 800.93 which consolidates the common requirements for grounding, bonding, and interruption. This revision removes this section to align with this consolidation effort.



City: State: Zip:	
Submittal Da	ate: Thu Jun 22 05:07:42 EDT 2023
Committee:	NEC-P16
Committee St	atement
<b>Resolution:</b>	FR-7782-NFPA 70-2024
Statement:	The cable substitution hierarchies have been incorporated into the general article, Article 800. This revision coordinates with action taken on 800.154 by deleting the cable substitution requirements from this Article

	Public Input No. 3346-NFPA 70-2	2023 [ Section No. 8	305.170 ]	
	805.170 Protectors.			
	Protectors shall be listed in accordance	with 805.170(A) or 80	<del>5.170(B) .</del>	
	(A) Primary Protectors.			
	The primary protector shall be listed and conductor and ground in an appropriate to indicate line and ground as applicable	<del>I consist of an arrester c mounting. Primary prote 5.</del>	onnected between e ctor terminals shall t	<del>ach line</del> <del>se marked</del>
	Informational Note: See ANSI/UL Conductor Communications Circu primary protector.	<del>497-2017,</del> <del>Standard for</del> it <del>s , to determine applica</del>	Protectors for Paired Ble requirements for	<del>d</del> <del>a listed</del>
	(B) Secondary Protectors.			
	The secondary protector shall be listed a less than the current-carrying capacity of telephone set line cords, and listed com external wire line communications circui connection shall be connected on the ec current-limiting means.	as suitable to provide mo of listed indoor communion munications terminal eq ts. Any overvoltage prot quipment terminals side	eans to safely limit cu cations wire and cabl uipment having ports ection, arresters, or g of the secondary pro	urrents to le, listed <del>) for</del> grounding tector
	Informational Note: See ANSI/UL Communications Circuits , to dete protector.	497A-2019,- Standard fo rmine applicable require	<del>)r Secondary Protect</del> ments for a listed sec	<del>tors for</del> condary
Add	itional Proposed Changes			
	File Name	Desci	<u>iption</u>	<u>Approved</u>
	Limited_Energy_TG_Substantiation.docx	Limited Energy TG ( Substantiation	Chair	
Stat	ement of Problem and Substantia	ation for Public Inp	ut	
ļ	As part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and P	G, the section is deleted rimary Protective Article	I as it is relocated inte	o the new
Rela	ted Public Inputs for This Docum	ient		
	Related Input Public Input No. 3340-NFPA 70-2023 [Sec	tion No. 800.49]	<u>Relationship</u>	
Sub	mitter Information Verification			
5	Submitter Full Name: Derrick Atkins			
C	Drganization: Minneapolis Electric	al JATC		
S	Street Address:			
C	City:			
S	State:			
Z	lip:			

Submittal Date:Fri Sep 01 14:10:01 EDT 2023Committee:NEC-P16

## **Committee Statement**

**Resolution:** For clarity, ease-of-use, and avoiding confusion it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 805 for communications circuits.

Pub NFPA	lic Input N	lo. 2968-NFPA 70-2023 [ Section No. 810.3 ]
810	.3 Other Arti	cles.
Wiri sha	ng from the s Il comply with	ource of power to and between devices connected to the interior wiring system the following:
(1)	Chapters 1 t	hrough 4 other than as modified by <u>Article 640,</u> Parts I and II- <del>of Article 640</del> .
(2)	Coaxial cabl article of Cha	es that connect antennas to equipment shall comply with the appropriate apter 8.
(3)	Wiring and e appropriate	equipment installed in hazardous (classified) locations shall comply with the requirements in Chapter 5.
4.1.4 R Article articles number The Us Chad K Submitte	eferences to 100 or where shall be perr r shall preced ability Task G (ennedy and r Informat	an Entire Article. References shall not be made to an entire article, except for the referenced to provide the necessary context. References to specific parts within nitted. References to all parts of an article shall not be permitted. The article le the part number. Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, David Williams.
Submit	ter Full Nam	ie: David Williams
Organi	zation:	Delta Charter Township
Street / City: State: Zip:	Address:	
Submit	tal Date:	Mon Aug 28 13:32:31 EDT 2023
Commi	ttee:	NEC-P16
Committe	e Stateme	ent
Resolu Statem	i <b>tion:</b> <u>FR-75</u> ient: The te:	<u>86-NFPA 70-2024</u> xt has been edited to comply with 4.1.4 of the NEC Style Manual.

<b>NFPA</b>	olic Input N	o. 4001-NFPA 70-2023 [ Section No. 810.3 ]
810	0.3 Other Arti	cles.
Wir sha	ing from the s all comply with	ource of power to and between devices connected to the interior wiring system the following:
(1)	Chapters 1 t	hrough 4 other than as modified by Parts I and II of Article 640.
(2)	Coaxial cable article of Cha	es that connect antennas to equipment shall comply with the appropriate apter 8.
(3)	Wiring and e appropriate r	quipment installed in hazardous (classified) locations shall comply with the equirements in <del>Chapter 5</del> <u>I DON'T KNOW WHAT TO PUT HERE</u> .
Submitte	er Informati	on Verification
Submi	tter Full Nam	Cieco Systems
Organi		Cisco Systems
Citv:	Autress.	
State:		
Zip:		
	ttal Date:	Wed Sep 06 13:22:13 EDT 2023
Submi	ittee:	NEC-P16
Comm		
Comm	ee Stateme	int

<u>810. 2 Definit</u>	ons. The definitions in Article 100 shall apply.
810. 3 Other	Articles.
Wiring from the shall comply w	e source of power to and between devices connected to the interior wiring system ith the following:
(1) Chapters	1 through 4 other than as modified by Parts I and II of Article 640.
(2) Coaxial ca article of C	bles that connect antennas to equipment shall comply with the appropriate Chapter 8.
(3) Wiring and	equipment installed in hazardous (classified) locations shall comply with the
appropriat tement of Prol According to 800. be a reference in a	e requirements in Chapter 5. Delem and Substantiation for Public Input 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. Action Verification
appropriat tement of Prol According to 800. be a reference in omitter Informa	e requirements in Chapter 5. <b>Diem and Substantiation for Public Input</b> 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. <b>Ation Verification</b> <b>Ime:</b> Ryan Jackson
appropriat tement of Prol According to 800. be a reference in A omitter Informa Submitter Full Na Organization:	e requirements in Chapter 5. Dem and Substantiation for Public Input 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. Ation Verification me: Ryan Jackson Self-employed
appropriat tement of Prol According to 800. be a reference in A omitter Informa Submitter Full Na Organization: Street Address:	e requirements in Chapter 5. Dem and Substantiation for Public Input 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. Ation Verification me: Ryan Jackson Self-employed
appropriat appropriat According to 800. be a reference in A <b>omitter Informa</b> Submitter Full Na Organization: Street Address: City:	e requirements in Chapter 5. <b>Diem and Substantiation for Public Input</b> 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. <b>Ation Verification</b> <b>Ime:</b> Ryan Jackson Self-employed
appropriat appropriat According to 800. be a reference in A <b>omitter Informa</b> Submitter Full Na Organization: Street Address: City: State:	e requirements in Chapter 5. Dem and Substantiation for Public Input 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. Ation Verification Imme: Ryan Jackson Self-employed
appropriat appropriat According to 800. be a reference in A <b>omitter Informa</b> Submitter Full Na Organization: Street Address: City: State: Zip:	e requirements in Chapter 5. <b>Diem and Substantiation for Public Input</b> 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. <b>Ation Verification</b> me: Ryan Jackson Self-employed
appropriat appropriat According to 800. be a reference in A <b>omitter Informa</b> Submitter Full Na Organization: Street Address: City: State: Zip: Submittal Date:	e requirements in Chapter 5. Delem and Substantiation for Public Input 1, Article 800 applies to Articles 805, 820, 830, and 840. Due to this, there needs Article 810 that points to Article 100, otherwise it does not apply due to 90.3. Attion Verification Imme: Ryan Jackson Self-employed Thu Apr 20 16:05:37 EDT 2023

If an antenna lead-in surge protector is installed, it shall be (A) listed as being suitable for limiting surges on the cable that connects the antenna to the receiver/transmitter electronics- and shall be , and (B) connected between the conductors and the grounded shield or other ground connection: The antenna lead-in protector shall be grounded , and (C) grounded using a bonding conductor or grounding electrode conductor installed in accordance with 810.21(F). Informational Note: See UL 497E, Outline of Investigation for Protectors for Antenna Lead-In Conductors, for information concerning protectors for antenna lead-in conductors. tement of Problem and Substantiation for Public Input There are three very different requirements within this one paragraph. The three requirements cov Listing, Location and Grounding. For clarity and easy reference they should be split out as separa numbered items. This revision places them in three distinct numbered subsections - (A) requirement is about protect device Listing, item (B) is about the protector Location in the lead-in connection , and item (C) is a Grounding requirement criteria. brinter Information Verification Submitter Full Name: Trevor Bowmer Organization: Bunya Telecom Consulting, LLC Street Address: City: State: Zip:	in surge protector is installed, it shall be suitable for limiting surges on the cable that connects the antenna to the r electronics- <del>and shall be , and</del> ween the conductors and the grounded shield or other ground connection <del>.</del> <del>n protector shall be grounded , and</del> g a bonding conductor or grounding electrode conductor installed in 10.21(F). Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna</i> <i>ductors</i> , for information concerning protectors for antenna lead-in
<ul> <li>(A) listed as being suitable for limiting surges on the cable that connects the antenna to the receiver/transmitter electronics- and shall be , and</li> <li>(B) connected between the conductors and the grounded shield or other ground connection. The antenna lead-in protector shall be grounded , and</li> <li>(C) grounded using a bonding conductor or grounding electrode conductor installed in accordance with 810.21(F).</li> <li>Informational Note: See UL 497E, Outline of Investigation for Protectors for Antenna Lead-in conductors, for information concerning protectors for antenna lead-in conductors.</li> </ul> tement of Problem and Substantiation for Public Input There are three very different requirements within this one paragraph. The three requirements cov Listing, Location and Grounding. For clarity and easy reference they should be split out as separa numbered items. This revision places them in three distinct numbered subsections - (A) requirement is about protect device Listing, item (B) is about the protector Location in the lead-in connection , and item (C) is a Grounding requirement criteria. <b>Submitter Full Name:</b> Trevor Bowmer <b>Organization:</b> Bunya Telecom Consulting, LLC <b>Street Address: City: State: Zip:</b>	suitable for limiting surges on the cable that connects the antenna to the r electronics- and shall be , and ween the conductors and the grounded shield or other ground connection <del>.</del> <del>n protector shall be grounded</del> , and g a bonding conductor or grounding electrode conductor installed in 10.21(F). Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna</i> <i>ductors</i> , for information concerning protectors for antenna lead-in <b>n and Substantiation for Public Input</b>
<ul> <li>(B) connected between the conductors and the grounded shield or other ground connection: The antenna lead-in protector shall be grounded , and         <ul> <li>(C) grounded using a bonding conductor or grounding electrode conductor installed in accordance with 810.21(F).             <ul></ul></li></ul></li></ul>	<ul> <li>ween the conductors and the grounded shield or other ground connection.</li> <li>n protector shall be grounded , and</li> <li>g a bonding conductor or grounding electrode conductor installed in 10.21(F).</li> <li>Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna ductors</i>, for information concerning protectors for antenna lead-in</li> <li>n and Substantiation for Public Input</li> </ul>
( <u>C</u> ) grounded_using a bonding conductor or grounding electrode conductor installed in accordance with 810.21(F). Informational Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna Lead-In Conductors</i> , for information concerning protectors for antenna lead-in conductors. <b>tement of Problem and Substantiation for Public Input</b> There are three very different requirements within this one paragraph. The three requirements cov Listing, Location and Grounding. For clarity and easy reference they should be split out as separa numbered items. This revision places them in three distinct numbered subsections - (A) requirement is about protect device Listing, item (B) is about the protector Location in the lead-in connection , and item (C) is a Grounding requirement criteria. <b>Submitter Information Verification</b> <b>Submitter Full Name:</b> Trevor Bowmer <b>Drganization:</b> Bunya Telecom Consulting, LLC <b>Street Address:</b> <b>City:</b> <b>State:</b> <b>Zip:</b>	g a bonding conductor or grounding electrode conductor installed in 10.21(F). Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna</i> <i>ductors</i> , for information concerning protectors for antenna lead-in <b>n and Substantiation for Public Input</b>
Informational Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna Lead-In Conductors</i> , for information concerning protectors for antenna lead-in conductors.  ement of Problem and Substantiation for Public Input There are three very different requirements within this one paragraph. The three requirements cov. Listing, Location and Grounding. For clarity and easy reference they should be split out as separa numbered items. This revision places them in three distinct numbered subsections - (A) requirement is about protect levice Listing, item (B) is about the protector Location in the lead-in connection , and item (C) is a Grounding requirement criteria.  mitter Information Verification Submitter Full Name: Trevor Bowmer Drganization: Bunya Telecom Consulting, LLC Street Address: Lity: Litate: Lip:	Note: See UL 497E, <i>Outline of Investigation for Protectors for Antenna ductors</i> , for information concerning protectors for antenna lead-in
ement of Problem and Substantiation for Public Input There are three very different requirements within this one paragraph. The three requirements cov isting, Location and Grounding. For clarity and easy reference they should be split out as separa numbered items. This revision places them in three distinct numbered subsections - (A) requirement is about protect levice Listing, item (B) is about the protector Location in the lead-in connection , and item (C) is a Grounding requirement criteria. mitter Information Verification Submitter Full Name: Trevor Bowmer Drganization: Bunya Telecom Consulting, LLC Street Address: City: State: Cip:	n and Substantiation for Public Input
Organization:       Bunya Telecom Consulting, LLC         Street Address:         City:         State:         Zip:	n verification
Street Address: City: State: Zip:	Bunya Telecom Consulting, LLC
City: State: Zip:	
State: Zip:	
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Submittal Date: Tue Sep 05 10:40:50 EDT 2023	Tue Sep 05 10:40:50 EDT 2023
Street Address: City: State: Zip:	: Trevor Bowmer
ubmittal Date: ommittee: mittee Statemer	

Public I	nput No. 3347-NFPA 70-20	023 [ Sections 810.6, 810.7 ]	
NFPA			
Section	<del>s 810.6, 810.7</del>		
<del>810.6</del> /	Antenna Lead-In Protectors.		
If an ante surges o be conne antenna conducte	enna lead-in surge protector is in n the cable that connects the and ected between the conductors an lead-in protector shall be ground or installed in accordance with 8	stalled, it shall be listed as being suitab tenna to the receiver/transmitter electro id the grounded shield or other ground ed using a bonding conductor or groun 10.21(F) -	<del>le for limiting</del> <del>nics and shall connection. The</del> <del>ding electrode</del>
Infi Le col	o <del>rmational Note: See UL 497E, <i>ad-In Conductors</i> , for information <del>nductors.</del></del>	Outline of Investigation for Protectors f n concerning protectors for antenna lea	<del>or Antenna</del> d <del>-in</del>
<del>810.7</del> (	<del>Grounding Devices.</del>		
<del>If bondin carrying conducte</del>	g or grounding is required, devic metal members of a cable, or me or grounding electrode conduc	es used to connect a shield, a sheath, i etal parts of equipment or antennas to a tor shall be listed or be part of listed eq	non-current- a bonding uipment.
Additional Pr	oposed Changes		
	File Name	Description	<u>Approved</u>
Limited_En	ergy_TG_Substantiation.docx	Limited Energy TG Chair Substantiation	
Statement of	Problem and Substantiat	ion for Public Input	
As part of th Limited Ene	e work by the Limited Energy TG rgy Grounding, Bonding, and Pri	G, the section is deleted as it is relocate mary Protective Article.	d into the new
Submitter Inf	ormation Verification		
Submitter F	ull Name: Derrick Atkins		
Organizatio Street Addr City: State:	n: Minneapolis Electrica ess:	IJATC	
Zip:			
Submittal D	<b>ate:</b> Fri Sep 01 14:11:48 E	DT 2023	
Committee:	NEC-P16		
Committee S	tatement		
Resolution	The text from 810.6 is not just r under PI-3333 (Section 50.2). T of the requirement. The revision X50.	relocated but revised significantly in the There is no technical justification suppli ns proposed under PI-3629 were not in	new Article X50 ed for the revision cluded in Article

NFPA 810.13 Avoida	nce of Contacts with Conductors of Other Systems.
Outdoor antenr open conductor <u>mm (2 ft.)</u> from <del>proximity to ope conductors can least 600 mm (</del> ;	as and lead-in conductors from an antenna to a building shall not cross over s of electric light or power circuits and shall be <del>kept well away</del> <u>not less than 600</u> all such circuits- <del>so as to avoid the possibility of accidental contact</del> <del>Where en electric light or power service conductors of less than 250 volts between not be avoided, the installation shall be such as to provide a clearance of at 2 ft).</del>
Where practica light or power c	ble, antenna conductors shall be installed so as not to cross under open electric onductors.
Statement of Prob The term "well awa the existing the 2' r 2' clearance for cire Submitter Informa	<b>Iem and Substantiation for Public Input</b> by" is about as unenforceable as it gets. This PI condenses the language by moving equirement up and deleting the rest of the language. There is no reason to specify cuits of LESS THAN 250V if we have no requirements for higher voltages. <b>tion Verification</b>
Statement of Prob The term "well awa the existing the 2' r 2' clearance for cirr Submitter Informa Submitter Full Na	<b>Iem and Substantiation for Public Input</b> by" is about as unenforceable as it gets. This PI condenses the language by moving equirement up and deleting the rest of the language. There is no reason to specify cuits of LESS THAN 250V if we have no requirements for higher voltages. <b>tion Verification</b> <b>me:</b> Ryan Jackson
Statement of Prob The term "well awa the existing the 2' r 2' clearance for circ Submitter Informa Submitter Full Na Organization: Street Address: City: State: Zip:	Iem and Substantiation for Public Input ny" is about as unenforceable as it gets. This PI condenses the language by moving equirement up and deleting the rest of the language. There is no reason to specify cuits of LESS THAN 250V if we have no requirements for higher voltages. tion Verification me: Ryan Jackson Self-employed
Statement of Prob The term "well awa the existing the 2' r 2' clearance for circ Submitter Informa Submitter Full Na Organization: Street Address: City: State: Zip: Submittal Date:	Iem and Substantiation for Public Input and a unenforceable as it gets. This PI condenses the language by moving equirement up and deleting the rest of the language. There is no reason to specify cuits of LESS THAN 250V if we have no requirements for higher voltages. tion Verification me: Ryan Jackson Self-employed Mon Apr 10 13:07:12 EDT 2023
Statement of Prob The term "well awa the existing the 2' r 2' clearance for circ Submitter Informa Submitter Full Na Organization: Street Address: City: State: Zip: Submittal Date: Committee:	Iem and Substantiation for Public Input ny" is about as unenforceable as it gets. This PI condenses the language by moving equirement up and deleting the rest of the language. There is no reason to specify cuits of LESS THAN 250V if we have no requirements for higher voltages. tion Verification me: Ryan Jackson Self-employed Mon Apr 10 13:07:12 EDT 2023 NEC-P16

<del>810.15</del> (	Grounding or Bonding.		
Masts and with-810.3 of protecti	Hetal structures supporting a 21 <del>, unless the antenna and its</del> on defined by a 46 m (150 ft) r	ntennas shall be grounded or bonded in related supporting mast or structure are adius rolling sphere.	<del>accordance</del> within a zone
Info Prot	mational Note: See NFPA 780 ection Systems , 4.7.3.1, for th	) <del>-2020,- Standard for the Installation of L</del> e application of the term- <del>rolling sphere</del>	<del>.ightning</del> <del>.</del>
dditional Pro	posed Changes		
	File Name	<b>Description</b>	<u>Approve</u>
Limited_Ene	gy_TG_Substantiation.docx	Limited Energy TG Chair Substantiation	
Limited_Ene	rgy_TG_Substantiation.docx Problem and Substantia	Limited Energy TG Chair Substantiation tion for Public Input	
Limited_Ener tatement of I As part of the Limited Energ	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG y Grounding, Bonding, and Pr	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energ ubmitter Info	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG y Grounding, Bonding, and Pr prmation Verification	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energ ubmitter Info	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG by Grounding, Bonding, and Pr prmation Verification	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energ ubmitter Info Submitter Fu Organization	gy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG y Grounding, Bonding, and Pr mation Verification II Name: Derrick Atkins : Minneapolis Electrica	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energ ubmitter Info Submitter Fu Organization Street Addre	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG y Grounding, Bonding, and Pr rmation Verification II Name: Derrick Atkins : Minneapolis Electrica ss:	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energy ubmitter Info Submitter Fu Organization Street Addre City:	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG y Grounding, Bonding, and Pr mation Verification II Name: Derrick Atkins : Minneapolis Electrica ss:	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energ ubmitter Info Submitter Fu Organization Street Addre City: State: Zip:	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG gy Grounding, Bonding, and Pr prmation Verification II Name: Derrick Atkins : Minneapolis Electrica ss:	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new
Limited_Ener tatement of I As part of the Limited Energ ubmitter Info Submitter Fu Organization Street Addre City: State: Zip: Submittal Da	rgy_TG_Substantiation.docx Problem and Substantia work by the Limited Energy TG y Grounding, Bonding, and Pr rmation Verification II Name: Derrick Atkins : Minneapolis Electrica ss: te: Fri Sep 01 14:13:07	Limited Energy TG Chair Substantiation tion for Public Input G, the section is deleted as it is relocate imary Protective Article.	d into the new



#### (E) Run in Straight Line.

The bonding conductor or grounding electrode conductor for an antenna mast or antenna discharge unit shall be run in as straight a line as practicable.

#### (F) Electrode.

The bonding conductor or grounding electrode conductor shall be connected as required in 810.21(F)(1) through 810.21(F)(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 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 power service accessible means external to the building, as covered in 250.94
- (3) The nonflexible metal power service raceway
- (4) The service equipment enclosure
- (5) The grounding electrode conductor or the grounding electrode conductor metal enclosures of the power service
- (6) 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

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.

(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 810.21(F)(2), the grounding electrode conductor shall be connected to a grounding electrode as described in 250.52.

(G) Inside or Outside Building.

The bonding conductor or grounding electrode conductor shall be permitted to be run either inside or outside the building.

(H) Size.

The bonding conductor or grounding electrode conductor shall not be smaller than 10 AWG copper, 8 AWG aluminum, or 17 AWG copper-clad steel or bronze.

(I) Common Ground.

A single bonding conductor or grounding electrode conductor shall be permitted for both protective and operating purposes.

(J) Bonding of Electrodes.

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

(K) Electrode Connection.

Connections to grounding electrodes shall comply with 250.70 -

Additional Proposed	d Changes		
<u>File I</u>	Name	Description	<u>Approved</u>
Limited_Energy_TG	_Substantiation.docx	Limited Energy TG Chair Substantiation	
Statement of Proble	m and Substantiat	ion for Public Input	
As part of the work by Limited Energy Grou	y the Limited Energy TO nding, Bonding, and Pri	G, the section is deleted as it is relocat mary Protective Article.	ed into the new
Submitter Information	on Verification		
Submitter Full Name	e: Derrick Atkins		
Organization:	Minneapolis Electrica	IJATC	
Street Address:			
City:			
State:			
Zip:	E-i San 01 14:15:04 E		
Committee:	NEC-P16	DT 2023	
Committee Stateme	nt		
Resolution: The tex Article 2 justifica PI-3636 that we of-use a antenna	It from 810.20 and 810.2 X50 under PI-3333 (Sec tion supplied for the rev 5, PI-1240 and PI-3638 re not considered and c and usability it is more a a systems explicitly in o	21 is not just relocated but revised sign stion X50.60, X50.66 and X50.68). The risions of the requirement. There are s that were submitted to revise the text oordinated with any action on this X50 appropriate to have as many requirement ne article such as 810 rather than in X	nificantly in the new ere is no technical everal PIs including of current 810.21 ). For clarity, ease- ents as practical for (50.

Public Input No. 3636-NFPA 70-2023 [ Section No. 810.21(A) ]				
(A) Mate	(A) Material.			
The bond clad steel copper-cl if subject to corrosi not be ins	ing conductor or grounding electrode conductor shall be of copper, aluminum, copper- , copper-clad aluminum, bronze, or similar corrosion-resistant material. Aluminum or ad aluminum bonding conductors or grounding electrode conductors shall not be used to corrosive conditions or in direct contact with masonry or the earth- <del>or where subject</del> <del>ve conditions</del> . If used outside, aluminum or copper-clad aluminum conductors shall stalled within 450 mm (18 in.) of the earth.			
Statement of Problem and Substantiation for Public Input The phrase "or where subject to corrosive conditions." is superfluous given the phrase "if subject to corrosive conditions " is already used earlier in the sentence and covers the condition.				
Submitter Information Verification				
Submitter F	JII Name: Trevor Bowmer			
Organizatio	Bunya Telecom Consulting, LLC			
Street Addre	ISS:			
City:				
State:				
Zip:				
Submittal Da	ate: Tue Sep 05 10:53:50 EDT 2023			
Committee:	NEC-P16			
Committee Statement				
Resolution:	FR-7595-NEPA 70-2024			
Statement:	The phrase "or where subject to corrosive conditions" is not needed since the phrase "if subject to corrosive conditions " is already used earlier in the sentence and covers the condition.			

Public II	nput No. 1240-NFPA 70-2023 [ Section No. 810.21(C) ]			
(C) Supp	ports.			
The bond <del>and shall</del> <del>insulating</del>	The bonding conductor or grounding electrode conductor shall be securely fastened in place and shall be permitted to be directly attached to the surface wired over without the use of insulating supports.			
<del>Exceptic</del> <del>groundir</del>	Exception: Where proper support cannot be provided, the size of the bonding conductors or grounding electrode conductors shall be increased proportionately.			
Statement of	Problem and Substantiation for Public Input			
The existing And what typ to be in prop	language does not make sense. What does "attached to the surface wired over" mean? the of support is "proper support"? And when we increase proportionaly, what is it supposed portion to?			
Submitter Full Nemer Dven Joskoon				
Organization Street Addre City: State:	n: Self-employed			
Zip: Submittal Da Committee:	ate: Thu Jun 29 13:02:27 EDT 2023 NEC-P16			
Committee St	atement			
Resolution: Statement:	<u>FR-7596-NFPA 70-2024</u> The previous language was unenforceable and has been revised to be more clear for the user. The language in the exception was not explicitly clear in its use of the word "proportionately" and created confusion on when the user must securely fasten a conductor.			
ductor or grounding electrode conductor shall be securely fastened in place				
--				
nitted to be directly attached to the surface wired over without the use of ts.				
re- <u>If</u> proper support cannot be provided, the size of the bonding conductors octrode conductors shall be increased proportionately.				
em and Substantiation for Public Input				
pould be changed to "If" in the exception to reflect that this is a condition and not				
addition, it is not practical to have a different larger conductor dauge only where				
rovided with a splice to lesser gauge where support could be provided.				
on Verification				
on Verification e: Trevor Bowmer				
on Verification e: Trevor Bowmer Bunya Telecom Consulting, LLC				
on Verification e: Trevor Bowmer Bunya Telecom Consulting, LLC				
on Verification e: Trevor Bowmer Bunya Telecom Consulting, LLC				
on Verification e: Trevor Bowmer Bunya Telecom Consulting, LLC				
on Verification e: Trevor Bowmer Bunya Telecom Consulting, LLC				
on Verification e: Trevor Bowmer Bunya Telecom Consulting, LLC				

Sections 810.57, 810.58		
810.57 Antenna Discharge Units — Tr	ansmitting Stations.	
Each lead-in conductor for outdoor ante or other suitable means that drain static	nnas shall be provided with an antenna ( charges from the antenna system.	<del>discharge unit</del>
Exception No. 1: If the lead-in conduct grounded with a conductor in accordan suitable means shall not be required fo	or is protected by a continuous metal shi i <del>ce with 810.58 , an antenna discharge t</del> r the lead-in conductor.	<del>eld that is</del> <del>ınit or other</del>
Exception No. 2: If the antenna is grou 810.58 , an antenna discharge unit or c	nded or bonded with a conductor in acco other suitable means shall not be require	<del>ordance with</del> <del>d.</del>
810.58 Bonding Conductors and Grou Band Transmitting and Receiving Static	nding Electrode Conductors — Amateur <del>ons.</del>	<del>and Citizen</del>
Bonding conductors and grounding elect <del>810.58(C) .</del>	ctrode conductors shall comply with 810	<del>.58(A) -through</del>
(A) Other Sections.		
All bonding conductors and grounding e transmitting and receiving stations shall	lectrode conductors for amateur and citiz comply with-810.21(A) through-810.21	<del>zen band</del> <del>(C) :</del>
(B) Size of Protective Bonding Conduct	ctor or Grounding Electrode Conductor.	
The protective bonding conductor or gro shall be as large as the lead-in but not s steel.	ounding electrode conductor for transmitt smaller than 10 AWG copper, bronze, or d	<del>ing stations</del> <del>copper-clad</del>
(C) Size of Operating Bonding Conduct	ctor or Grounding Electrode Conductor.	
The operating bonding conductor or gro shall not be less than 14 AWG copper o	<del>unding electrode conductor for transmitti</del> <del>r its equivalent.</del>	<del>ng stations</del>
ditional Proposed Changes		
File Name	<b>Description</b>	Approv
Limited_Energy_TG_Substantiation.docx	Limited Energy TG Chair Substantiation	
atement of Problem and Substantia	ation for Public Input	
As part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and P	G, the section is deleted as it is relocate rimary Protective Article.	d into the new
As part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and P bmitter Information Verification	<b>ation for Public Input</b> G, the section is deleted as it is relocate rimary Protective Article.	d into the new
As part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and P bmitter Information Verification	ation for Public Input G, the section is deleted as it is relocate rimary Protective Article.	d into the new
As part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and P bmitter Information Verification Submitter Full Name: Derrick Atkins Organization: Minneapolis Electric	ation for Public Input G, the section is deleted as it is relocate rimary Protective Article.	d into the new
atement of Problem and SubstantiaAs part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and PIbmitter Information VerificationSubmitter Full Name: Derrick Atkins Organization:Minneapolis Electric Street Address:	ation for Public Input <sup>T</sup> G, the section is deleted as it is relocate rimary Protective Article.	d into the new
As part of the work by the Limited Energy T Limited Energy Grounding, Bonding, and P bmitter Information Verification Submitter Full Name: Derrick Atkins Organization: Minneapolis Electric Street Address: City:	ation for Public Input <sup>T</sup> G, the section is deleted as it is relocate rimary Protective Article.	d into the new
atement of Problem and Substantia         As part of the work by the Limited Energy T         Limited Energy Grounding, Bonding, and P         ubmitter Information Verification         Submitter Full Name: Derrick Atkins         Organization:       Minneapolis Electric         Street Address:         City:         State:	ation for Public Input <sup>T</sup> G, the section is deleted as it is relocate rimary Protective Article.	d into the new

Submittal Date:	Fri Sep 01 14:16:52 EDT 2023
Committee:	NEC-P16

# **Committee Statement**

**Resolution:** For clarity, ease-of-use and useability it is more appropriate to have as many requirements as practical for antenna systems explicitly in one article such as 810 rather than in X50, and 800 and 810

Public Input No. 2	969-NFPA 70-2023 [ Section No. 810.70 ]
810.70 Separation fro	om Other Conductors.
All conductors inside t of any electric light, po	he building shall be separated at least 100 mm (4 in.) from the conductors ower, or signaling circuit unless one of the following conditions applies:
(1) The conductors o Parts I and II- <del>of A</del>	f a permanent audio system are installed in compliance with <u>Article 640,</u> <del>article 640</del> .
(2) The conductors o <u>Article 640,</u> Parts	f portable and temporary audio systems are installed in compliance with a I and III- <del>of Article- 640</del> .
(3) The conductors a nonconductor.	re separated from such other conductors by a continuous and firmly fixed
Statement of Problem a	and Substantiation for Public Input
in order to provide correla Style Manual Section 4.1. 4.1.4 References to an En Article 100 or where refer articles shall be permitted number shall precede the The Usability Task Group Chad Kennedy and David	submitted on behalf of the NEC Correlating Committee Osability Task Group ition throughout the document. The text is revised to to comply with the NEC 4, regarding the use of Parts. ntire Article. References shall not be made to an entire article, except for the enced to provide the necessary context. References to specific parts within 1. References to all parts of an article shall not be permitted. The article part number. members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, d Williams.
Submitter Information V	/erification
Submitter Full Name: Da	avid Williams
Organization: De Street Address: City: State: Zip:	Ita Charter Township
Submittal Date: Mo Committee: NE	on Aug 28 13:33:20 EDT 2023 EC-P16
Committee Statement	
<b>Resolution:</b> <u>FR-7863-NI</u> <b>Statement:</b> Revised to a	<u>-PA 70-2024</u> align with the NEC style manual.



Public I	nput No. 3354-NFPA 70-2	2023 [ Sections 810.71(A), 810.71(B)	]
Sections	<del>s 810.71(A), 810.71(B)</del>		
(A) Enc	<del>losing.</del>		
The transmitter shall be enclosed in a metal frame or grille or separated from the operating space by a barrier or other equivalent means, all metallic parts of which are effectively connected to a bonding conductor or grounding electrode conductor.			
(B) Grounding of Controls.			
All external metal handles and controls accessible to the operating personnel shall be effectively connected to an equipment grounding conductor if the transmitter is powered by the premises wiring system or grounded with a conductor in accordance with 810.21 -			
Additional Pr	oposed Changes		
Limited_Ene	File Name	<b>Description</b> As part of the work by the Limited Energy TG, the section is deleted as it is relocated into the new Limited Energy Grounding, Bonding, and Primary Protective Article.	<u>Approved</u>
Statement of	Problem and Substantia	tion for Public Input	
As part of the Limited Ener	e work by the Limited Energy T gy Grounding, Bonding, and Pi	G, the section is deleted as it is relocated into rimary Protective Article.	the new
Submitter Inf	ormation Verification		
Submitter F	ull Name: Derrick Atkins		
Organizatio Street Addro City: State: Zip:	n: Minneapolis Electric: ess:	al JATC	
Submittal D	ate: Fri Sep 01 14:22:36	EDT 2023	
Committee:	NEC-P16		
Committee St	tatement		
Resolution:	For clarity, ease-of-use, and u requirements as practical for a than in X50, 810 and 800.	seability it is more appropriate to have as man antenna systems explicitly in one article such a	y is 810 rather



(D) Hazardous (Classified) Locations.

If a primary protector or equipment providing the primary protection function is used, it shall not be located in any hazardous (classified) location as defined in 500.5 and 505.5 or in the vicinity of easily ignitible material.

*Exception: Primary protection equipment shall be used only if permitted by 501.150, 502.150, and 503.150.* 

Part IV III. Grounding Methods

820.100 Cable Bonding and Grounding.

The shield of the coaxial cable shall be bonded or grounded as specified in 820.100(A) and (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 NFPA 780-2020, *Standard for the Installation of Lightning Protection Systems*, 4.7.3.1, for the application of the term *rolling sphere*.

(A) General Requirements.

The installation shall be in accordance with 800.100.

(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.

820.103 Equipment Grounding.

Unpowered equipment and enclosures or equipment powered by the coaxial cable shall be considered grounded where connected to the metallic cable shield.

Part ¥ IV. Installation Methods Within Buildings



# **Submitter Information Verification**

Submitter Full Name: Ryan Jackson	
Organization:	Self-employed
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Mon Apr 10 13:05:29 EDT 2023
Committee:	NEC-P16

### **Committee Statement**

Resolution: <u>FR-7725-NFPA 70-2024</u>

Statement: Per 2.1.5.4 of the Style manual Parts in Article 820 have been numbered sequentially.

<ul> <li>820.3 Other Articles.</li> <li>The wiring methods of Article 830 shall be permitted to substitute for the wiring methods of Article 820 this article.</li> <li>Informational Note: Use of Article 830 wiring methods will facilitate the upgrading of Article 820 installations of installations covered by this article to network-powered broadband applications.</li> <li>Statement of Problem and Substantiation for Public Input</li> </ul>		
<ul> <li>The wiring methods of Article 830 shall be permitted to substitute for the wiring methods of Article-820 this article.</li> <li>Informational Note: Use of Article 830 wiring methods will facilitate the upgrading of Article-820 installations of installations covered by this article to network-powered broadband applications.</li> <li>Statement of Problem and Substantiation for Public Input</li> </ul>		
Informational Note: Use of Article 830 wiring methods will facilitate the upgrading <del>of</del> Article 820 installations <u>of installations covered by this article</u> to network-powered broadband applications. Statement of Problem and Substantiation for Public Input Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or		
Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or		
Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or		
Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or where required for context. As such, it is recommended that we change the two locations in this text where we reference Article 820 to "this article" but leave the Article 830 references "for context".		
Submitter Information Verification		
Submitter Full Name: Richard Holub		
Organization: The DuPont Company, Inc.		
Street Address:		
City: State:		
Zip:		
Submittal Date: Tue Sep 05 08:31:03 EDT 2023		
Committee: NEC-P16		
Committee Statement		
Resolution: FR-7604-NFPA 70-2024		
Statement: Section 820.3 was renumbered to 820.4 to comply with NEC Style Manual section 2.2. References to an entire article were eliminated in order to comply with the NEC Style Manual.		

<del>820</del>	
Coa Wh sha equ mol 9.0 req	ere the outer conductive shield of a coaxial cable is grounded, no other protective devices Il be required. For purposes of this section, grounding located at mobile home service ipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a bile home disconnecting means grounded in accordance with 250.32 and located within m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the uirements of this section.
	Informational Note: Selecting a grounding block location to achieve the shortest practicable bonding conductor or grounding electrode conductor helps limit potential differences between CATV and other metallic systems.
<del>(A)</del>	- <del>Entering Buildings.</del>
<del>In in</del> <del>grou</del> poin	i <del>stallations where the coaxial cable enters the building, the outer conductive shield shall bu inded in accordance with-820.100 . The grounding shall be as close as practicable to the it of entrance.</del>
<del>(B)</del>	- <del>Terminating Outside of the Building.</del>
<del>In in</del> con clos	istallations where the coaxial cable is terminated outside of the building, the outer ductive shield shall be grounded in accordance with 820.100 . The grounding shall be as e as practicable to the point of attachment or termination.
<del>(C)</del>	- <del>Location.</del>
Whe radi loca grou	ere installed, a listed primary protector shall be applied on each community antenna and o distribution (CATV) cable external to the premises. The listed primary protector shall be nted as close as practicable to the entrance point of the cable on either side or integral to the und block.
<del>(D)</del>	- Hazardous (Classified) Locations.
<del>lf a be k</del> <del>vicir</del>	primary protector or equipment providing the primary protection function is used, it shall no ocated in any hazardous (classified) location as defined in- 500.5 and- 505.5 or in the nity of easily ignitible material.
<del>Exc</del> <del>502</del>	<del>ception: Primary protection equipment shall be used only if permitted by-501.150 ,</del> <del>2.150 , and-503.150 .</del>
emen	t of Problem and Substantiation for Public Input
o incre eneral ommo	ease clarity and help code users by gathering as many common requirements in a single communications Article 800, a series of revisions have been submitted to consolidate the n "Grounding, Bonding and Interruption" criteria of 805.93, 820.93, 830.93 and 840.93 inte A Article 800 under a new section 800.93.

Several related and correlated revisions will be required to create the new 800.93 including 1. The creation of a new section (820.90) to accommodate the protector requirements currently in 820.93 into a new section more accurately entitled "protectors" and numbered to be parallel with other related protection sections 805.90, 830.90 and 840.90.

2. Delete 805.93 since all the requirements will now be covered in the new 800.93

3. Creation of a new 800.93 in the general communications Article 800, that includes the common "Grounding, Bonding and Interruption" criteria of 805.93, 820.93, 830.93 and 840.93.

4. Delete 830.93 since all the requirements will now be covered in the new 800.93

5. Revise 840.93 to replace references to the old 805.93 and 820.93 sections with equivalent references to the new 800.93

6. Revise 840.94 to replace references to the old 805.93 sections with equivalent references to the new 800.93

7. Revise 800.133 to replace references to the old 820.93 sections with equivalent references to the new 800.93.

This revisions continues the consolidation efforts of last 2-3 code cycles to gather common requirements for communications cables and systems into Article 800.

### **Related Public Inputs for This Document**

#### Related Input

Relationship

Public Input No. 3645-NFPA 70-2023 [New Part after III.]

Public Input No. 3650-NFPA 70-2023 [New Part after III.]

Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-

Sections]]

Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]

Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]

Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]

Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]

Public Input No. 3645-NFPA 70-2023 [New Part after III.]

Public Input No. 3650-NFPA 70-2023 [New Part after III.]

Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]

Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]

Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]

Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]

Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-Sections]]

# **Submitter Information Verification**

Submitter Full Name: Trevor Bowmer

Organization:Bunya Telecom Consulting, LLCStreet Address:City:City:State:Zip:Tue Sep 05 12:22:57 EDT 2023Committee:NEC-P16

## **Committee Statement**

Resolution: FR-7729-NFPA 70-2024

**Statement:** The committee has created new section 800.93 and 820.90 which consolidates common requirements for grounding, bonding, and interruption. This revision removes 820.93 which has been incorporated into 800.93 and 820.90 and aligns with this consolidation effort.



7. Revise 800.133 to replace references to the old 820.93 sections with equivalent references to the

#### new 800.93.

This revisions continues the consolidation efforts of last 2-3 code cycles to gather common requirements for communications cables and systems into Article 800.

**Related Input** 

### **Related Public Inputs for This Document**

#### **Relationship**

Public Input No. 3660-NFPA 70-2023 [Section No. 805.93] Public Input No. 3654-NFPA 70-2023 [Section No. 820.93] Public Input No. 3645-NFPA 70-2023 [New Part after III.] Public Input No. 3650-NFPA 70-2023 [New Part after III.] Public Input No. 3663-NFPA 70-2023 [Section No. 840.93] Public Input No. 3666-NFPA 70-2023 [Section No. 840.94] Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-Sections]] Public Input No. 3645-NFPA 70-2023 [New Part after III.] Public Input No. 3650-NFPA 70-2023 [New Part after III.] Public Input No. 3654-NFPA 70-2023 [Section No. 820.93] Public Input No. 3660-NFPA 70-2023 [Section No. 805.93] Public Input No. 3663-NFPA 70-2023 [Section No. 840.93] Public Input No. 3666-NFPA 70-2023 [Section No. 840.94] Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-Sections]]

# **Submitter Information Verification**

Submitter Full Name:	Trevor Bowmer
Organization:	Bunya Telecom Consulting, LLC
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Sep 05 12:35:54 EDT 2023
Committee:	NEC-P16

# **Committee Statement**

Resolution: FR-7772-NFPA 70-2024

**Statement:** The committee has created new section 800.93 which consolidates the common requirements for grounding, bonding, and interruption. This revision removes Part IV to align with this consolidation effort.



(a) *Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables.* Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(b) Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits. Low-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits:

- (3) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Parts I and II of Article 725
- (4) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
- (5) Communications circuits in compliance with Parts I and IV of Article 805
- (6) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770
- (7) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(h) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Optical Fiber Cables and Other Communications Cables*. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

- (9) Communications circuits in compliance with Parts I and IV of Article 805
- (10) Conductive optical fiber cables in compliance with Parts I and V of Article 770
- (11) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(I) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits* . Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

- (13) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Parts I and II of Article 725
- (14) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(o) *Electric Light, Power, Class 1, Nonpowered Broadband Communications Circuit Cables.* Network-powered broadband communications cable shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables.

Exception No. 1: Network-powered broadband communications cable shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Exception No. 2: Where power circuit conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the network-powered broadband communications system distribution equipment, the power

circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (<sup>1</sup>/4 -in.) separation from network-powered broadband communications cables.

(2) Other Applications.

Network-powered broadband communications cable shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, and non-power-limited fire alarm circuits.

Exception No. 1: Separation shall not be required where: (1) all of the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits are in a raceway or in metalsheathed, metal-clad, nonmetallic-sheathed, Type AC, or Type UF cables, or (2) all of the network-powered broadband communications cables are encased in a raceway.

Exception No. 2: Separation shall not be required where the network-powered broadband communications cables are permanently separated from the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

#### Additional Proposed Changes

File Name

Description First Draft Substantiation **Approved** 

Limited\_Energy\_TG\_First\_Draft\_Substantiation.docx

#### Statement of Problem and Substantiation for Public Input

This text is being deleted as part of the reorganization of the limited energy articles. The deleted text is relocated as a general requirement to new Article X00.

# **Submitter Information Verification**

 Submitter Full Name: Mark Hilbert

 Organization:
 MR Hilbert Insp. & Training

Street Address:City:State:Zip:Submittal Date:Sun Sep 03 06:30:47 EDT 2023Committee:NEC-P16

### **Committee Statement**

**Resolution:** The text from Article 830 is not relocated but greatly shortened and technically altered in the Section X00.100 of the new proposed Article X00 under PI 3234. There is no technical justification supplied for the technical changes to the text. There are several PIs including PI-1667, PI-2966, PI-3930, PI-4036, PI-899, PI-4175, PI-1178, PI-1179, PI-1176, and PI-3670 have been submitted to modify 800.133 with concerns of updates, word changes and deletions to the text. Without including such revisions, the result will introduce conflicts and confusion between the new X00 Article and possible First Draft actions on these PIs.



(a) Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables. Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(b) Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits. Low-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits:

(3) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with</u> <u>Article 725, Parts I and II</u>

of Article 725

(1)

(2) Power-limited fire alarm systems in compliance with Article 760, Parts I and III

of Article 760

(1)

(2) Communications circuits in compliance with Article 805, Parts I and IV

of Article 805

(1)

(2) <u>Nonconductive and conductive optical fiber cables in compliance with</u> <u>Article 770, Parts I</u> <u>and V</u>

of Article 770

(1)

(2) <u>Community antenna television and radio distribution systems in compliance with Article</u> <u>820, Parts I and V</u>

of Article 820

(1)

(d) Medium-Power Network-Powered Broadband Communications Circuit Cables with Optical Fiber Cables and Other Communications Cables. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

(5) Communications circuits in compliance with Article 805, Parts I and IV

```
of Article 805
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(1)

(2) <u>Conductive optical fiber cables in compliance with</u> <u>Article 770</u>, <u>Parts I and V</u>

of Article 770

(1)

(2) <u>Community antenna television and radio distribution systems in compliance with</u> <u>Article</u> <u>820, Parts I and V</u>

of Article 820

(1)

(f) Medium-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

(7) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with</u> <u>Article 725, Parts I and II</u>

of Article 725

(1)

(2) Power-limited fire alarm systems in compliance with Article 760, Parts I and III

of Article 760

(1)

(h) *Electric Light, Power, Class 1, Nonpowered Broadband Communications Circuit Cables.* Network-powered broadband communications cable shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables.

Exception No. 1: Network-powered broadband communications cable shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Exception No. 2: Where power circuit conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the network-powered broadband communications system distribution equipment, the power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (<sup>1</sup>/<sub>4</sub> in.) separation from network-powered broadband communications cables.

#### Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

#### **Submitter Information Verification**

David Williams
Delta Charter Township
Mon Aug 28 13:34:32 EDT 2023
NEC-P16

Committee St	atement
<b>Resolution:</b>	FR-8102-NFPA 70-2024
Statement:	The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 800.133(A)(1).
	In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables 2, Class 3 and Class 4 cables, which are always listed.
	Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". Other editorial changes were made to correct typographical errors in $800.133(A)(1)(e)$ .
	The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number." Some of the references were revised because of changes made in the 2023 NEC.



(a) Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables. Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(b) Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits. Low-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits:

- (3) <u>Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with</u> <u>Parts I and II of Article</u> <u>725</u>
- (4) Class 4 fault managed power circuits in compliance with Parts I and II of Article 726
- (5) <u>Power-limited fire alarm systems in compliance with Parts I and III of Article</u> 760
- (6) <u>Communications circuits in compliance with Parts I and IV of Article</u> 805
- (7) <u>Nonconductive and conductive optical fiber cables in compliance with Parts I and V of</u> <u>Article 770</u>
- (8) <u>Community antenna television and radio distribution systems in compliance with Parts I and</u> <u>V of Article 820</u>

(i) Medium-Power Network-Powered Broadband Communications Circuit Cables with Optical Fiber Cables and Other Communications Cables. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

- (10) Communications circuits in compliance with Parts I and IV of Article 805
- (11) Conductive optical fiber cables in compliance with Parts I and V of Article 770
- (12) <u>Community antenna television and radio distribution systems in compliance with Parts I and</u> <u>V of Article 820</u>

(m) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits*. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

- (14) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Parts I and II of Article 725
- (15) Class 4 fault managed power circuits in compliance with Parts I and II of Article 726
- (16) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(q) *Electric Light, Power, Class 1, Nonpowered Broadband Communications Circuit Cables.* Network-powered broadband communications cable shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables.

Exception No. 1: Network-powered broadband communications cable shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Exception No. 2: Where power circuit conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the network-powered broadband communications system distribution equipment, the power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (¼ in.) separation from network-powered broadband communications cables.

# Statement of Problem and Substantiation for Public Input

Class 4 systems were added in the 2023 code and have equivalent of better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application. This effort should have happened for the 2023 code and not doing it was an oversight.

Article 722 covers Class 2, Class 3, and Class 4 cables and treats them all the same. Therefore, Class 4 should be added to this list.

# **Submitter Information Verification**

Submitter Full Name: Chad Jones	
Organization:	Cisco Systems
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed Sep 06 10:48:52 EDT 2023
Committee:	NEC-P16

### **Committee Statement**

Resolution: FR-8102-NFPA 70-2024

**Statement:** The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 800.133(A)(1).

In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3 and Class 4 cables, which are always listed.

Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". Other editorial changes were made to correct typographical errors in 800.133(A)(1)(e).

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number." Some of the references were revised because of changes made in the 2023 NEC.



(a) Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables. Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly. (b) Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits.- Low Listed low -power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits 1 (1) Listed Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Parts I and II of Article 725Power cables (2) Listed Class 4 cables (3) Listed power -limited fire alarm systems in compliance with Parts I and III of Article 760 (3) Communications circuits in compliance with Parts I and IV of Article 805 Nonconductive cables (4) Listed communications cables (5) Listed nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770Community (6) Listed community antenna television and radio distribution systems in compliance with Parts I and V of Article 820 system coaxial cables (d) Medium-Power Network-Powered Broadband Communications Circuit Cables with Optical Fiber Cables and Other Communications Cables. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits: (5) Communications circuits in compliance with Parts I and IV of Article 805 (6) Conductive optical fiber cables in compliance with Parts I and V of Article 770 **Community** <u>:</u> (1) Listed communications cables (2) Listed conductive optical fiber cables Listed community antenna television and radio distribution systems in compliance with (3) Parts I and V of Article 820 system coaxial cables (7) Medium-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits

	- (1) Listed Class 2 and Class 3 remote-control signaling and nower-limited
	circuite in compliance with Parte Land II of Article 725
	cables
	(2) Listed Power-limited fire alarm
	systems in compliance with Parts I and III of Article 760
(0)	Laures
(6)	<u>Network-powerd broadband communications cable shall not be placed in any raceway,</u> <u>cable tray, compartment, outlet box, junction box, or similar fittings with conductors of</u> <u>electric light, power, Class 1, or non-power-limited fire alarm circuit cables.</u>
	<u>Exception No. 1: Network-powered broadband communications cable shall be permitted</u> to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power- limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.
	<u>Exception No. 2: Where power circuit conductors in outlet boxes, junction boxes, or</u> <u>similar fittings or compartments where such conductors are introduced solely for power</u> <u>supply to the network-powered broadband communications system distribution</u> <u>equipment, the power circuit conductors shall be routed within the enclosure to maintain a</u> <u>minimum 6 mm (½ in.) separation from network-powered broadband communications</u> <u>cables.</u>
Statemen	t of Problem and Substantiation for Public Input
<ul> <li>Se</li> <li>limited f</li> <li>permiss</li> <li>Ch</li> <li>state in</li> <li>Article)</li> </ul>	ection 725.139(C) permits Class 4 cables in the same pathway as Class 2 & Class 3, power- fire alarm, optical fiber, CATV and low-power network-powered broadband cables. Reciprocal sion is needed in this Article. nanges to reflect these are listed cables and other readability improvements (e.g., no need to compliance with the installation rules of the Article, as already required for cabling under that
Submitte	r Information Verification
Submit	ter Full Name: Jeff Silveira
Organiz	zation: Bicsi
Street A	Address:
City:	
State:	
Zip:	
Submit	tal Date: Wed Sep 06 14:42:07 EDT 2023
Commi	ttee: NEC-P16
Committee Statement	
Resolu	tion: FR-8102-NFPA 70-2024
Statem	<b>tent:</b> The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 800.133(A)(1).

In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is

need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3 and Class 4 cables, which are always listed.

Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". Other editorial changes were made to correct typographical errors in 800.133(A)(1)(e).

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number." Some of the references were revised because of changes made in the 2023 NEC.


(a) Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables.-Low\_Listed low - and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(b) Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits Cables .- Low \_ Listed low -power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following-circuits :

(3) Listed Class 2 and Class 3 remote-control, signaling, and power-limited

circuits

(1) <u>cables installed in compliance with 645.5(E)(2); or Article 722, Part I and Article 725, Parts</u> <u>I and II</u>

of Article 725Power

(1)

- (2) Listed Class 4 cables installed in compliance with Article 722, Part I and Article 726, Parts I and II
- (3) Listed power -limited fire alarm

systems

(1) cables installed in compliance with Article 760, Parts I and III

of Article 760Communications circuits

(1)

(2) Listed communications cables installed in compliance with Article 800, Parts I and IV

of Article 805

(1)

#### Nonconductive

(1) <u>Listed nonconductive and conductive optical fiber cables installed in compliance with</u> <u>Article 770, Parts I and V</u>

of Article 770

(1)

Community

(1) <u>Listed community antenna television and radio distribution systems</u> <u>coaxial cables installed</u> <u>in compliance with</u> <u>Article 800</u>, <u>Parts I and</u>

<del>V of</del>

(1) IV, and Article 820, Parts I and V

(d) Medium-Power Network-Powered Broadband Communications <del>Circuit</del> Cables with Optical Fiber Cables and Other Communications Cables. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with <del>conductors of</del> any of the following- <del>circuits</del> :

(5) Communications circuits in compliance with Parts I and IV of Article 805 Conductive (1) Listed communications cables

(2) Listed conductive optical fiber cables

in compliance with Parts I and V of Article 770Community

(1)

(2) Listed community antenna television and radio distribution systems

in compliance with Parts I and V of Article 820

(1) coaxial cables

(f) Medium-Power Network-Powered Broadband Communications Circuit- Cables with Other Circuits Cables. Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors- of any of the following-circuits:

(7) Listed Class 2 and Class 3 remote-control, signaling, and power-limited

circuits in compliance with Parts I and II of Article 725Power

(1) <u>cables</u>

(2) Listed power -limited fire alarm

systems in compliance with Parts I and III of Article 760

(1) cables

(h) Electric Light, Power, Class 1, Nonpowered <u>Non-Power-Limited Fire Alarm and</u> <u>Network-Powered</u> Broadband Communications <del>Circuit</del> Cables.-Network <u>Listed network</u> powered broadband communications <del>cable</del> <u>cables</u> shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with <u>cables or</u> conductors of electric light, power, Class 1, or non-power-limited fire alarm <del>circuit cables</del> <u>circuits</u>.

Exception No. 1:- <u>Network</u> <u>Listed network</u>-powered broadband communications <u>cable</u> <u>cables</u> shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with <u>cables or</u> conductors of electric light, power, Class 1, or non-power-limited fire alarm <del>circuit cables</del> <u>circuits</u> where all of the <u>cables or</u> conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Exception No. 2: Where power circuit conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the network-powered broadband communications system distribution equipment, the power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (<sup>1</sup>/<sub>4</sub> in.) separation from network-powered broadband communications cables.

#### **Statement of Problem and Substantiation for Public Input**

The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 800.133(A)(1).

In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3 and Class 4 cables, which are always listed.

Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". Other editorial changes were made to correct typographical errors in 800.133(A)(1)(e).

Relationship

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number." Some of the references were revised because of changes made in the 2023 NEC.

#### **Related Public Inputs for This Document**

# Related Input Public Input No. 817-NFPA 70-2023 [Section No. 725.139] Public Input No. 818-NFPA 70-2023 [Section No. 726.139] Public Input No. 895-NFPA 70-2023 [Section No. 760.139] Public Input No. 918-NFPA 70-2023 [Section No. 770.133(C)]

#### Submitter Information Verification

Submitter Full Name: David KiddooOrganization:CCCAAffiliation:Communications Cable & Connectivity AssociationStreet Address:City:City:State:State:Sign:Submittal Date:Mon May 15 07:37:36 EDT 2023Committee:NEC-P16

#### **Committee Statement**

Resolution: FR-8102-NFPA 70-2024

**Statement:** The primary purpose of this PI is to correlate with 726.139(C) which permits Class 4 cables to be run in the same pathway as the cables in 800.133(A)(1).

In order to improve usability, word "listed" is inserted before each cable type to clarify that all the cables that are permitted to be run together are listed cables. This clarification is need to avoid any interpretation that unlisted outside-plant communications and optical fiber cables are permitted to be run with listed communications and optical fiber cables, and Class 2, Class 3 and Class 4 cables, which are always listed.

Minor editorial changes were made clarify that "the installation" needs to be in compliance with the installation rules, not the "circuit". Other editorial changes were made to correct typographical errors in 800.133(A)(1)(e).

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, "The article number shall precede the part number." Some of the references were revised because of changes made in the 2023 NEC.

# Public Input No. 1119-NFPA 70-2023 [ Section No. 830.154 ]

830.154 Substitutions of Network-Powered Broadband Communications System Cables.

The substitutions for network-powered broadband system cables listed in Table 830.154 shall be permitted.

Table 830.154 Cable Substitutions

<u>Cable</u> <u>Type</u>	Permitted Cable Substitutions
BM	BMR
BLP	CMP, CL3P
BLR	CMP, CL3P, CMR, CL3R, BLP, BMR
BL	CMP, CMR, CM, CMG, CL3P, CL3R, CL3, BMR, BM, BLP, BLR
BLX	CMP, CMR, CM, CMG, CMX, CL3P, CL3R, CL3, CL3X, BMR, BM, BLP, <del>BRP</del> <u>BLR</u> , BL

#### Statement of Problem and Substantiation for Public Input

This PI fixes a typo in the table. BRP cable does not exist.

Submitter Full Na	
Organization:	CableSafe, Inc./OFS
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sun Jun 18 02:42:45 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: <u>FR-7789-NFPA 70-2024</u>

Submitter Information Verification

**Statement:** The cable substitution hierarchies have been incorporated into the general article, Article 800. This revision coordinates with action taken on 800.154 by deleting the cable substitution requirements from this Article. With the deletion of this section, the revision to correct a typo is not needed.

Public Input No. 1172-NFPA 70-2023 [ Section No. 830.154 ]			
<del>830.154</del>	- Substitutions of Network-Powered Broad	dband Communications System Cables.	
<del>The subs</del> <del>permitted</del>	titutions for network-powered broadband <del>I.</del>	system cables listed in- Table 830.154 shall be	
Table 830	0.154 Cable Substitutions		
<del>Cable Ty</del> ţ <del>CL3R, BL</del> <del>CMR, CN</del>	pe Permitted Cable Substitutions BM BMF _P, BMR BL CMP, CMR, CM, CMG, CL3P /I, CMG, CMX, CL3P, CL3R, CL3, CL3X, I	≹ <del>BLP CMP, CL3P BLR CMP, CL3P, CMR,</del> <del>, CL3R, CL3, BMR, BM, BLP, BLR BLX CMP,</del> B <del>MR, BM, BLP, BRP, BL</del>	
Statement of	Problem and Substantiation for	Public Input	
PI 1169 mov coordinates	ves the cable substitution hierarchies into with PI 1169 by deleting the cable substit	the general article (Article 800). This PI ution requirements from this Article.	
Related Publi	ic Inputs for This Document		
Public Input 800.154] Public Input	Related Input t No. 1169-NFPA 70-2023 [Section No. t No. 1169-NFPA 70-2023 [Section No.	<b>Relationship</b> Moves cable substitutions into 800.154	
Submitter Inf	ormation Verification		
Submitter F	ull Name: Leslie Jutte		
Organizatio	n: Plastics Industry Association		
Affiliation: Street Addre	Plastics Industry Association (	PLASTICS)	
City:			
State:			
Zip:			
Submittal D	Date: Thu Jun 22 04:45:24 EDT 202	3	
Committee:	NEC-PT6		
Committee S	Committee Statement		
Resolution:	: <u>FR-7789-NFPA 70-2024</u>		
Statement:	The cable substitution hierarchies have 800. This revision coordinates with actic substitution requirements from this Artic correct a typo is not needed.	been incorporated into the general article, Article in taken on 800.154 by deleting the cable le. With the deletion of this section, the revision to	

Network-powered broadband communications equipment and cables shall be list marked in accordance with 830.179(A)- through and (C E).         Exception No. 1: Exception       This listing requirement shall not apply to communications and radio distribution system coaxial cables that were installed prior to 2000, in accordance with Article 820 and are used for low-power network-power communications circuits.         Exception No. 2: Substitute cables for network-powered broadband communications circuits.         Exception No. 2: Substitute cables for network-powered broadband communications in the permitted as shown in Table 830.154:         (B)-         (A)_         General Requirements:         The general requirements in 800.179         Shall be permitted as shown in Table 630.154:         (B)-         (A)_         General Requirements:         The general requirements in 800.179         Shall be far assembled cables consisting of a jacketed combination of an optical not able and multiple individual conductors, or a jacketed combination of an optical and multiple individual conductors, or a jacketed combination of an optical for outdoor underground use:         (C         B)-       Network-Powered Broadband Communications low-power cables shall be factory cables consisting of a jacketed combination of an optical fiber cable         isteed for 300 volts minimum. Cables intended for outdoor underground use:       (         G       B)-       Network-Powered Broadband Communication Low-Power Cables.	3.
Exception No-1- Exception       This listing requirement shall not apply to communitelevision and radio distribution system coaxial cables that were installed prior to 2000, in accordance with Article 820 and are used for low-power network-power communications circuits.         Exception No. 2: Substitute cables for network-powered broadband communications low provided as shown in Table 830.154 - (A)_         (B)-         (A)_         Ceneral Requirements:         The general requirements in 800.179 shall apply:         Network-Powered Broadband Communications Medium-Power Cables.         Network-powered broadband communications medium-power cables shall be fat assembled cables consisting of a jacketed coaxial cable, a jacketed combination cable and multiple individual conductors, or a jacketed combination of an optical and multiple individual conductors. The insulation for the individual conductors at the application. Cables shall be marked in accordance with 310.8 - Type BMU c be jacketed and listed as being suitable for outdoor underground use:         (C         B)-       Network-Powered Broadband Communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of an optical fiber cable multiple individual conductors, or a jacketed combination of a state of a 300 volts minimum. Cables intended for outdoor underground use:         (         B)-       Network-Powered Broadband Communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of can optical fiber cable multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individ	sted and
Exception No. 2: Substitute cables for network-powered broadband communice shall be permitted as shown in Table 830.154 :         (B)-         (A)_         Ceneral Requirements.         The general requirements in 800.179 shall apply.         Network-Powered Broadband Communications Medium-Power Cables.         Network-powered broadband communications medium-power cables shall be fact assembled cables consisting of a jacketed coaxial cable, a jacketed combination cable and multiple individual conductors, or a jacketed combination of an optical and multiple individual conductors. The insulation for the individual conductors as the application. Cables shall be marked in accordance with 310.8 . Type BMU c be jacketed and listed as being suitable for outdoor underground use.         (C         B) Network-Powered Broadband Communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cambles individual conductors, or a jacketed combination of coaxial cambles consisting of a jacketed coaxial cable, a jacketed combination of coaxial cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cables on solution coductors shall be factory cables consisting of a jacketed in accordance with 310.8 . Type BLU cable jacketed and listed as suitable for outdoor use shall be listed as suitable for pplication. Cables shall be marked in accordance with 310.8 . Type BLU	nity antenna to January 1, ered broadbai
<ul> <li>(⊕)-         <ul> <li>(A)_</li> <li>General Requirements:</li> </ul> </li> <li>The general requirements in 800.179 shall apply:</li> <li>Network-Powered Broadband Communications Medium-Power Cables.</li> <li>Network-powered broadband communications Medium-Power Cables.</li> <li>Network-powered broadband conductors, or a jacketed combination of an optical and multiple individual conductors. The insulation for the individual conductors at rated for 300 volts minimum. Cables intended for outdoor use shall be listed as a the application. Cables shall be marked in accordance with 310.8. Type BMU c be jacketed and listed as being suitable for outdoor underground use.</li> <li>€</li> <li>B ) Network-Powered Broadband Communications low-power Cables.</li> <li>Network-powered broadband communications low-power Cables.</li> <li>Network-powered broadband communication for the individual conductors shall be factory cables consisting of a jacketed coasial cable, a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall be factory cables consisting of a jacketed coasial cable, a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall be application. Cables shall be marked in accordance with 310.8. Type BLU cable jacketed and listed as being suitable for outdoor use shall be listed as suitable for outdoor use shall be listed as suitable for outdoor use.</li> <li>tional Proposed Changes</li> <li>File Name Description Approved</li> <li>Polyotext as being suitable for outdoor underground use.</li> </ul>	<del>ations cables</del>
<ul> <li>(A)_ General Requirements: The general requirements in 800.179 shall apply: Network-Powered Broadband Communications Medium-Power Cables. Network-powered broadband communications medium-power cables shall be fact assembled cables consisting of a jacketed coaxial cable, a jacketed combination cable and multiple individual conductors, or a jacketed combination of an optical and multiple individual conductors. The insulation for the individual conductors shall be marked in accordance with 310.8. Type BMU c be jacketed and listed as being suitable for outdoor underground use:         <ul> <li>€</li> <li>B) - Network-Powered Broadband Communications Low-Power Cables.</li> </ul> </li> <li>Network-Powered Broadband Communication Low-Power Cables.</li> <li>Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cables and listed as being suitable for outdoor underground use:             <ul> <li>f</li> <li>C</li> <li>B) - Network-Powered Broadband Communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cables and listed as suitable for outdoor underground use:</li> <li>f</li> <li>G</li> <li>B) - Network-Powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cables multiple individual conductors. The insulation for the individual conductors and the power shall be listed as suitable for outdoor underground use.</li> </ul> </li> <li>tional Proposed Changes     <ul> <li>File Name Description Approved</li> <li>r] 1999 is MS Word format</li> </ul> </li> </ul>	
General Requirements:         The general requirements in 800.179 shall apply:         Network-Powered Broadband Communications Medium-Power Cables.         Network-powered broadband communications medium-power cables shall be far assembled cables consisting of a jacketed coaxial cable, a jacketed combination cable and multiple individual conductors, or a jacketed combination of an optical and multiple individual conductors. The insulation for the individual conductors are the application. Cables shall be marked in accordance with 310.8Type BMU or be jacketed and listed as being suitable for outdoor underground use:         (         G         B) - Network-Powered Broadband Communications low-Power Cables.         Network-powered broadband communications low-Power Cables.         Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cmultiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual be listed as suitable for outdoor use shall be listed as suitable for application. Cables shall be marked in accordance with 310.8Type BLU cable jacketed and listed as being suitable for outdoor use shall be listed as suitable for application. Cables shall be marked in accordance with 310.8Type BLU cable jacketed and listed as being suitable for outdoor underground use.         tional Proposed Changes	
The general requirements in 800.179 -shall apply:         Network-Powered Broadband Communications Medium-Power Cables.         Network-Powered broadband communications medium-power cables shall be far assembled cables consisting of a jacketed coaxial cable, a jacketed combination cable and multiple individual conductors. The insulation for the individual conductors shall be first as the application. Cables shall be marked in accordance with 310.8. Type BMU c be jacketed and listed as being suitable for outdoor underground use.         (       C         B) - Network-Powered Broadband Communication Low-Power Cables.         Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial of multiple individual conductors. The insulation for the individual conductors shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial of multiple individual conductors. The insulation for the individual conductors shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall be factory cables consisting of a jacketed for outdoor use shall be listed as suitable for outdoor use shall be listed as suitable for application. Cables shall be marked in accordance with 310.8. Type BLU cable jacketed and listed as being suitable for outdoor underground use.         tional Proposed Changes         Lite Name         Leic Name         Leic Name          PI 1999 is MS Word format	
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Network-powered broadband communications medium-power cables shall be far assembled cables consisting of a jacketed coaxial cable, a jacketed combination of an optical and multiple individual conductors. The insulation for the individual conductors strated for 300 volts minimum. Cables intended for outdoor use shall be listed as a the application. Cables shall be marked in accordance with 310.8. Type BMU c be jacketed and listed as being suitable for outdoor underground use.         (       C         B) - Network-Powered Broadband Communication Low-Power Cables.         Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cmultiple individual conductors, or a jacketed combination of coaxial cmultiple individual conductors. The insulation for the individual conductors are a jacketed combination of coaxial cmultiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall be marked in accordance with 310.8. Type BLU cables multiple individual conductors. The insulation for the individual conductors shall be marked in accordance with 310.8. Type BLU cables multiple individual conductors. The insulation for the individual conductors shall be marked in accordance with 310.8. Type BLU cables intended for outdoor use shall be listed as suitable for outdoor underground use.         f       C         g       Description         Approved       PI 1999 is MS Word format	
f         G         B)- Network-Powered Broadband Communication Low-Power Cables.         Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial of multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall to 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for application. Cables shall be marked in accordance with 310.8. Type BLU cable jacketed and listed as being suitable for outdoor underground use.         tional Proposed Changes <u>File Name</u> <u>Description</u> <u>Approved</u> I_1199_text.docx       PI 1999 is MS Word format         ment of Problem and Substantiation for Public Input	suitable for ables shall
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B) Network-Powered Broadband Communication Low-Power Cables. Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial of multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall be application. Cables intended for outdoor use shall be listed as suitable for application. Cables shall be marked in accordance with 310.8 . Type BLU cables jacketed and listed as being suitable for outdoor underground use. <b>File Name</b> <u>Description</u> <u>Approved</u> I_1199_text.docx PI 1999 is MS Word format <b>ment of Problem and Substantiation for Public Input</b>	
Network-powered broadband communications low-power cables shall be factory cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial or multiple individual conductors, or a jacketed combination of an optical fiber cable multiple individual conductors. The insulation for the individual conductors shall be 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for application. Cables shall be marked in accordance with 310.8. Type BLU cable jacketed and listed as being suitable for outdoor underground use.         tional Proposed Changes         File Name       Description       Approved         I_1199_text.docx       PI 1999 is MS Word format         ement of Problem and Substantiation for Public Input	
tional Proposed Changes          File Name       Description       Approved         I_1199_text.docx       PI 1999 is MS Word format         ment of Problem and Substantiation for Public Input	∕ <del>-assembled</del> <del>cable and</del> <del>∋ and</del> <del>be rated for</del> <del>∋r the</del> <del>∋s shall be</del>
File NameDescriptionApprovedI_1199_text.docxPI 1999 is MS Word formatment of Problem and Substantiation for Public Input	
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of a constant of the second s	
referce to out. It a is redundant. The recommended text deletes 830.170(A)	

### **Submitter Information Verification**

Submitter Full Name: Leslie Jutte		
Organization:	Plastics Industry Association	
Affiliation:	Plastics Industry Association (PLASTICS)	
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Submittal Date:	Sat Jun 24 09:24:54 EDT 2023	
Committee:	NEC-P16	

#### **Committee Statement**

Resolution: FR-7803-NFPA 70-2024

**Statement:** This revision deletes the redundant general requirement that is already located in Article 800.179. The revised cross-reference to Table 830.154 reflects the action which incorporated the table into Article 800.



Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]
Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]
Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]
Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]
Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub- Sections]]
Public Input No. 3645-NFPA 70-2023 [New Part after III.]
Public Input No. 3650-NFPA 70-2023 [New Part after III.]
Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]
Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]
Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]
Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]
Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub- Sections]]

## **Submitter Information Verification**

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Committee:	NEC-P16

#### **Committee Statement**

Resolution: FR-7706-NFPA 70-2024

**Statement:** The cross references have been updated due to the consolidation efforts to incorporate 805.93 and 820.93 into 800.93.



Public Input	No. 3660-NFPA 70-2023 [Section No. 805.93]		
Public Input	<u>No. 3661-NFPA 70-2023 [Section No. 830.93]</u>		
Public Input	Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]		
Public Input	No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-		
Sections]]			
Submitter Inf	ormation Verification		
Submitter F	ull Name: Trevor Bowmer		
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Submittal D	ate: Tue Sep 05 12:53:35 EDT 2023		
Committee:	NEC-P16		
Committee Statement			
<b>Resolution:</b>	FR-7785-NFPA 70-2024		
Statement:	The cross-references in this section have been revised due to the actions taken to consolidate common requirements into a single general communications Article 800.		



<del>(C)</del>		
<u>(B)</u>		
Commun	communications wires and cap	es.
Demon	cations wires and caples shall be	histed and marked in accordance with 800.179 -
The new	<del>ource.</del>	
remote e sources (	<del>η source for circuits intended to p</del> <del>juipment shall be limited in accord</del> i <del>p to 60 volts dc and be listed as s</del>	Hance with Table 11(B) in Chapter 9 for voltage pecified in either of the following:
(1) - <del>A p</del> <del>The</del> inter	ower source shall be listed as spe oower sources shall not have the connected unless listed for such it	cified in 725.60(A)(1) , (A)(2), (A)(3), or (A)(4). output connections paralleled or otherwise aterconnection.
(2) - <del>A p</del>	<del>wer source shall be listed as con</del>	munications equipment for limited-power circuits.
Info	<del>rmational Note:</del> See	
ANSI/UL	<del>60950</del>	
UL	<del>,60950 <b>-</b>1</del>	
<del>-2014, St</del>	andard for Safety of	
<del>, </del>	nformation Technology Equipmen	<del>-Safety — Part 1</del> , or
ANSI/		
UL	<del>62368-1</del>	
<del>-2014</del>		
<del>,</del> A <del>Sai</del> the	udio/Video, Information and Comi ety Requirements - Typically, suc purpose of exchanging informatic	nunication Technology Equipment — Part 1: n circuits are used to interconnect equipment for n (data).
t		
Ð		
<del>C)</del> Acc	<del>essory Equipment.</del>	
Commun premises	cations accessory equipment and -powered communications system	/ <del>or assemblies shall be listed for application with</del> <del>is.</del>
Info	<del>rmational Note:</del> See	
ANSI/		
UL	<del>-1863</del>	
<del>-2004</del>		
<del>,</del> €	ommunications-Circuit Accessorie	<del>13</del> -
ional Pr	oposed Changes	
File Na	ne Description	Approved
_1198_tex	t.docx PI 1198 text in MS Wo	ord format
ment of	Problem and Substantiation	on for Public Input
eference to	800.179 is redundant. The recon	nmended text deletes 840.170(B)
e edition	ates for the UL standards were d	eleted because they are not needed. Section 90.5(C) in

as the latest edition of the standard."

ANSI was stricken from the title of the UL references to conform to current practice in references to UL standards.

The titles of the UL standards were revised to agree with the list of UL standards in the UL Standards online catalog. The words "Standard for" have been dropped from the titles of UL standards.

See the attached word doc for easy-to-read text.

#### **Submitter Information Verification**

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Submittal Date:	Sat Jun 24 09:05:00 EDT 2023	
Committee:	NEC-P16	

#### **Committee Statement**

**Resolution:** <u>FR-8106-NFPA 70-2024</u>

**Statement:** This revision deletes the redundant general requirement that is already located in Article 800.179.



https://submittals.nfpa.org/TerraViewWeb/ViewerPage.jsp

#### Statement of Problem and Substantiation for Public Input

To increase clarity and help code users by gathering as many common requirements in a single general communications Article 800, this revision will consolidate the common "Grounding, Bonding and Interruption" criteria of 805.93, 820.93, 830.93 and 840.93 into the General Article 800 under a new section 800.93.

No technical changes are intended or envisioned by these changes.

Several related and correlated revisions will be required to create the new 800.93 including 1. The creation of a new section (820.90) to accommodate the protector requirements currently in 820.93 into a new section more accurately entitled "protectors" and numbered to be parallel with other related protection sections 805.90, 830.90 and 840.90.

2. Delete 805.93 since all the requirements will now be covered in the new 800.93

3. Delete 820.93 since all the requirements will now be covered in the new 800.93 and the new 820.90

4. Delete 830.93 since all the requirements will now be covered in the new 800.93

5. Revise 840.93 to replace references to the old 805.93 and 820.93 sections with equivalent references to the new 800.93

6. Revise 840.94 to replace references to the old 805.93 sections with equivalent references to the new 800.93

7. Revise 800.133 to replace references to the old 820.93 sections with equivalent references to the new 800.93.

This revisions continues the consolidation efforts of last 2-3 code cycles to gather common requirements for communications cables and systems into Article 800.

#### **Related Public Inputs for This Document**

#### Related Input

**Relationship** 

Public Input No. 3650-NFPA 70-2023 [New Part after III.]

Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]

Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]

Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]

Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]

Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]

Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-

<u>Sections]]</u> Public Input No. 3650-NFPA 70-2023 [New Part after III.]

Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]

Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]

Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]

Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]

Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]

Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub-Sections]]

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Submittal Date:	Tue Sep 05 11:43:29 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: <u>FR-7700-NFPA 70-2024</u>

**Statement:** This revision establishes a new Section 800.93 Grounding, Bonding or Interruption of Metallic Members of Cables and incorporates the common requirements of 805.93, 820.93, and 830.93.



	Public Input No. 3645-NFPA 70-2023 [New Part after III.]
	Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]
	Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]
	Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]
	Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]
	Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]
	Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub- Sections]]
	Public Input No. 3645-NFPA 70-2023 [New Part after III.]
	Public Input No. 3654-NFPA 70-2023 [Section No. 820.93]
	Public Input No. 3660-NFPA 70-2023 [Section No. 805.93]
	Public Input No. 3661-NFPA 70-2023 [Section No. 830.93]
	Public Input No. 3663-NFPA 70-2023 [Section No. 840.93]
	Public Input No. 3666-NFPA 70-2023 [Section No. 840.94]
	Public Input No. 3670-NFPA 70-2023 [Section No. 800.133 [Excluding any Sub- Sections]]
Sub	omitter Information Verification

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Submittal Date:	Tue Sep 05 12:15:16 EDT 2023
Committee:	NEC-P16

#### **Committee Statement**

Resolution: FR-7989-NFPA 70-2024

**Statement:** This revision creates a new section that incorporates the protector requirements currently in 820.93 The section numbering parallels other related protection sections, see 805.90, 830.90, and 840.90.

Public Input No. 439-NFPA 70-2023 [ Part III. ]				
Part III <u>II</u> . Prote	ection			
Statement of Probl	Statement of Problem and Substantiation for Public Input			
This public input is p be re-numbered to b	ourely editorial in nature. The roman numerals for Parts III - V of Article 820 should be Parts II - IV.			
Submitter Informat	Submitter Information Verification			
Submitter Full Nam	<b>ne:</b> Ryan Andrew			
Organization:	Alaska Joint Electrical Apprenticeship and Training Trust			
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Zin <sup>.</sup>				
Submittal Date:	Thu Mar 09 01:24:50 EST 2023			
Committee:	NEC-P16			
Committee Statemo	Committee Statement			
Resolution: FR-77	25-NFPA 70-2024			
Statement: Per 2.	1.5.4 of the Style manual Parts in Article 820 have been numbered sequentially.			

# Public Input No. 3355-NFPA 70-2023 [ Sections Part III., 820.93, Part IV., 820.100, 820.103 ] Sections Part III., 820.93, Part IV., 820.100, 820.103 Part III. Protection 820.93 Grounding of the Outer Conductive Shield of Coaxial Cables. Coaxial cables entering buildings or attached to buildings shall comply with 820.93(A) or (B). Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required. For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section. Informational Note: Selecting a grounding block location to achieve the shortest practicable bonding conductor or grounding electrode conductor helps limit potential differences between CATV and other metallic systems. (A) Entering Buildings. In installations where the coaxial cable enters the building, the outer conductive shield shall be grounded in accordance with 820.100. The grounding shall be as close as practicable to the point of entrance. (B) Terminating Outside of the Building. In installations where the coaxial cable is terminated outside of the building, the outer conductive shield shall be grounded in accordance with 820.100. The grounding shall be as close as practicable to the point of attachment or termination. (C) Location. Where installed, a listed primary protector shall be applied on each community antenna and radio distribution (CATV) cable external to the premises. The listed primary protector shall be located as close as practicable to the entrance point of the cable on either side or integral to the ground block. (D) Hazardous (Classified) Locations. If a primary protector or equipment providing the primary protection function is used, it shall not be located in any hazardous (classified) location as defined in 500.5 and 505.5 or in the vicinity of easily ignitible material. Exception: Primary protection equipment shall be used only if permitted by 501.150, 502.150, and 503.150. Part IV. Grounding Methods 820.100 Cable Bonding and Grounding.

<del>The shie</del> <del>(B).</del>	ld of the coaxial cable shall be bo	onded or grounded as specified in 820.100(A)	and
Exception building (150 ft) permitte in 250: using a permitte shall no	on: For communications systems (i.e., they do not exit the building radius rolling sphere and isolated to be grounded by a connection 118 - Connecting to an equipmen dedicated bonding jumper and a ed. Use of a cord and plug for the t be permitted.	s using coaxial cable completely contained with g) or the exterior zone of protection defined by a d from outside cable plant, the shield shall be on to an equipment grounding conductor as des t grounding conductor through a grounded rece permanently connected listed device shall be connection to an equipment grounding conduct	<del>in the</del> <del>a 46 m</del> <del>cribed</del> <del>cptacle</del> <del>ctor</del>
Info Pro	ormational Note: See NFPA 780 otection Systems, 4.7.3.1, for the	<del>-2020, Standard for the Installation of Lightning</del> application of the term- rolling sphere -	Ĵ
<del>(A)</del> Ger	<del>neral Requirements.</del>		
The insta	Ilation shall be in accordance wit	<del>:h 800.100 .</del>	
( <b>B)</b> - Shie	eld Protection Devices.		
Groundin the grour	<del>g of a coaxial drop cable shield t</del> iding system within the premises	by means of a protective device that does not in shall be permitted.	nterrupt
<del>820.103</del>	- Equipment Grounding.		
Unpower considere	ed equipment and enclosures or ed grounded where connected to	equipment powered by the coaxial cable shall the metallic cable shield.	be
Additional Pr	oposed Changes		
	File Name	Description	<u>Approved</u>
		Limited Energy TC Chair	
Limited_Ene	ergy_TG_Substantiation.docx	Substantiation	
Limited_Ene Statement of	ergy_TG_Substantiation.docx Problem and Substantiat	Substantiation	
Limited_Ene Statement of As part of the Limited Ener	ergy_TG_Substantiation.docx <b>Problem and Substantiat</b> e work by the Limited Energy TG rgy Grounding, Bonding, and Prir	Substantiation ion for Public Input , the section is deleted as it is relocated into the mary Protective Article.	e new
Limited_Ene Statement of As part of the Limited Ener Submitter Infe	ergy_TG_Substantiation.docx <b>Problem and Substantiat</b> e work by the Limited Energy TG rgy Grounding, Bonding, and Prir <b>ormation Verification</b>	Substantiation ion for Public Input , the section is deleted as it is relocated into the mary Protective Article.	e new
Limited_Ene Statement of As part of the Limited Ener Submitter Info Submitter F	ergy_TG_Substantiation.docx <b>Problem and Substantiat</b> e work by the Limited Energy TG rgy Grounding, Bonding, and Prir <b>ormation Verification</b> ull Name: Derrick Atkins	Substantiation ion for Public Input a, the section is deleted as it is relocated into the mary Protective Article.	e new
Limited_Ene Statement of As part of the Limited Ener Submitter Infe Submitter F Organization Street Addre City: State:	ergy_TG_Substantiation.docx <b>Problem and Substantiat</b> e work by the Limited Energy TG rgy Grounding, Bonding, and Prir <b>ormation Verification</b> <b>ull Name:</b> Derrick Atkins n: Minneapolis Electrical ess:	Substantiation ion for Public Input i, the section is deleted as it is relocated into the mary Protective Article.	e new
Limited_Ene Statement of As part of the Limited Ener Submitter Infe Submitter F Organization Street Addre City: State: Zip:	ergy_TG_Substantiation.docx <b>Problem and Substantiat</b> e work by the Limited Energy TG rgy Grounding, Bonding, and Prir <b>ormation Verification</b> <b>ull Name:</b> Derrick Atkins <b>n:</b> Minneapolis Electrical <b>ess:</b>	Substantiation ion for Public Input a, the section is deleted as it is relocated into the mary Protective Article.	e new
Limited_Ene Statement of As part of the Limited Ener Submitter Infe Submitter F Organization Street Addre City: State: Zip: Submittal D Committee:	ergy_TG_Substantiation.docx         Problem and Substantiation         e work by the Limited Energy TG         rgy Grounding, Bonding, and Prir         ormation Verification         ull Name: Derrick Atkins         n:       Minneapolis Electrical         ess:         ate:       Fri Sep 01 14:24:14 E         NEC-P16	Substantiation ion for Public Input a, the section is deleted as it is relocated into the mary Protective Article. JATC DT 2023	e new
Limited_Ener Statement of As part of the Limited Ener Submitter Infe Submitter Infe Submitter F Organization Street Addre City: State: Zip: Submittal D Committee St	ergy_TG_Substantiation.docx         Problem and Substantiation         e work by the Limited Energy TG         rgy Grounding, Bonding, and Prir         ormation Verification         ull Name: Derrick Atkins         n:       Minneapolis Electrical         ess:         ate:       Fri Sep 01 14:24:14 E         NEC-P16	Substantiation ion for Public Input a, the section is deleted as it is relocated into the mary Protective Article. JATC DT 2023	e new

than X00, X50, X22, X90, 800 and 820. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, PI-3654, PI-3660, PI-3661, PI-3663, PI-3666, and PI-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93.

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Sections	Part III., 830.90, Part IV., 830.93
Part III.	Protection
<del>830.90</del> F	Primary Electrical Protection.
(A) Appl	ication.
Primary e communi entirely in provided that are n building s power co	electrical protection shall be provided on all network-powered broadband cations conductors that are neither grounded nor interrupted and are run partly or a aerial cable not confined within a block. Also, primary electrical protection shall be on all aerial or underground network-powered broadband communications conducto neither grounded nor interrupted and are located within the block containing the perved so as to be exposed to lightning or accidental contact with electric light or nductors operating at over 300 volts to ground.
Exception broadba circuit(s)	on: Primary electrical protection shall not be required on the network-powered nd communications conductors where electrical protection is provided on the derive (output side of the NIU) in accordance with 830.90(B)(3) -
Info not elec suc volt bro	prmational Note No. 1: On network-powered broadband communications conductor exposed to lightning or accidental contact with power conductors, providing primary ctrical protection in accordance with this article helps protect against other hazards, th as ground potential rise caused by power fault currents, and above-normal ages induced by fault currents on power circuits in proximity to the network-powere adband communications conductors.
Info con exis	ormational Note No. 2: Network-powered broadband communications circuits are isidered to have a lightning exposure unless one or more of the following conditions st:
(1)	Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning.
(2)	Areas having an average of five or fewer thunderstorm days each year and earth resistivity of less than 100 ohm-meters. Such areas are found along the Pacific coast.
Info Pro	ormational Note No. 3: See NFPA 780-2020, <i>Standard for the Installation of Lightni</i> tection Systems , for information on lightning protection systems.
<del>(1)</del> - <del>Fuse</del>	eless Primary Protectors.
Fuseless- conductor capacity c electrode	type primary protectors shall be permitted where power fault currents on all protectors in the cable are safely limited to a value no greater than the current-carrying of the primary protector and of the primary protector bonding conductor or grounding conductor.
<del>(2)</del> - <del>Fuse</del>	ed Primary Protectors.
Where the be used. I conductor an approp	e requirements listed in 830.90(A)(1) are not met, fused-type primary protectors sh Fused-type primary protectors shall consist of an arrester connected between each to be protected and ground, a fuse in series with each conductor to be protected, a priate mounting arrangement. Fused primary protector terminals shall be marked to

#### (B) Location.

The location of the primary protector, where required, shall comply with the following:

- A listed primary protector shall be applied on each network-powered broadband communications cable external to and on the network side of the network interface unit.
- (2) The primary protector function shall be an integral part of and contained in the network interface unit. The network interface unit shall be listed as being suitable for application with network-powered broadband communications systems and shall have an external marking indicating that it contains primary electrical protection.
- (3) The primary protector(s) shall be provided on the derived circuit(s) (output side of the NIU), and the combination of the NIU and the protector(s) shall be listed as being suitable for application with network-powered broadband communications systems.

A primary protector, whether provided integrally or external to the network interface unit, shall be located as close as practicable to the point of entrance.

For purposes of this section, a network interface unit and any externally provided primary protectors located at mobile home service equipment located in sight from and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located in sight from and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: Selecting a network interface unit and primary protector location to achieve the shortest practicable primary protector bonding conductor or grounding electrode conductor helps limit potential differences between communications circuits and other metallic systems.

(C) Hazardous (Classified) Locations.

The primary protector or equipment providing the primary protection function shall not be located in any hazardous (classified) location as defined in 500.5 and 505.5 or in the vicinity of easily ignitible material.

Exception: As permitted in 501.150 , 502.150 , and 503.150 -

Part IV. Grounding Methods

830.93 Grounding or Interruption of Metallic Members of Network-Powered Broadband Communications Cables.

Network-powered communications cables entering buildings or attaching to buildings shall comply with 830.93(A) or (B).

For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

Informational Note: Selecting a grounding location to achieve the shortest practicable bonding conductor or grounding electrode conductor helps limit potential differences between the network-powered broadband communications circuits and other metallic systems.

(A) Entering Buildings.

In installations where the network-powered communications cable enters the building, the shield shall be grounded in accordance with 800.100, and metallic members of the cable not used for communications or powering shall be grounded in accordance with 800.100 -or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.

<del>(B)</del> <del>Term</del>	inating Outside of the Building.			
In installati building, th the cable r <del>800.100 -o</del> shall be as	In installations where the network-powered communications cable is terminated outside of the building, the shield shall be grounded in accordance with 800.100, and metallic members of the cable not used for communications or powering shall be grounded in accordance with 800.100 or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment of the NIU.			
Additional Pro	posed Changes			
	File Name <u>Description</u> <u>Approved</u>			
Limited_Ener	gy_TG_Substantiation.docx Limited Energy TG Chair Substantiation			
Statement of F	Problem and Substantiation for Public Input			
As part of the Limited Energ	work by the Limited Energy TG, the section is deleted as it is relocated into the new y Grounding, Bonding, and Primary Protective Article.			
Submitter Info	Submitter Information Verification			
Submitter Fu	II Name: Derrick Atkins			
Organization	: Minneapolis Electrical JATC			
Street Addres	SS:			
City:				
State:				
Zip:				
Submittal Dat	te: Fri Sep 01 14:25:57 EDT 2023			
Committee:	NEC-P16			
Committee Sta	itement			
Resolution:	For clarity, ease-of-use and usability it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 830 and not spread between X00, X50, X90, 800, and 830. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI- 3650, PI-3654, PI-3660, PI-3661, PI-3663, PI-3666, and PI-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a			

single new 800.93



<del>(B)</del> - <del>Con</del>	nmunications Circuit Grounding.			
Communi	ications circuits shall not be required to be grounded.			
<del>(C)</del> − <del>Net</del>	work Terminal Grounding.			
The network coaxial ca the use o be permit	ork terminal shall not be required to be grounded unless required by its listing. If the able shield is separately grounded as described in 840.101(A)(1) or 840.101(A)(2) <del>,</del> f a cord and plug for the connection to the network terminal grounding connection shall ted.			
Info equ grou is c	ormational Note: If required to be grounded, a listed device that extends the hipment grounding conductor from the receptacle to the network terminal equipment unding terminal is permitted. Sizing of the extended equipment grounding conductor overed in Table 250.122 -			
<del>840.102</del>	- Premises Circuits Leaving the Building.			
If circuits zone of p communit of coaxial Info	leave the building to power equipment remote to the building or outside the exterior rotection defined by a 46 m (150 ft) radius rolling sphere, the installation of cations wires and cables shall comply with 800.100 and 800.106, and the installation cables shall comply with 820.100 and 800.106.			
110	tection systems, for the application of the term rowing sphere.			
Additional Pro	oposed Changes			
	File Name Description Approved			
Limited_Ene	ergy_TG_Substantiation.docx Limited Energy TG Chair Substantiation			
Statement of	tatement of Problem and Substantiation for Public Input			
As part of the Limited Ener	e work by the Limited Energy TG, the section is deleted as it is relocated into the new gy Grounding, Bonding, and Primary Protective Article.			
Submitter Info	ubmitter Information Verification			
Submitter Fi	ull Name: Derrick Atkins			
Organization	n: Minneapolis Electrical JATC			
Street Addre	ess:			
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Submittal Da	ate: Fri Sep 01 14:28:24 EDT 2023			
Committee:	NEC-P16			
Committee St	atement			
Resolution:	For clarity and ease-of-use, it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 840 and not spread between X00, X50, X90, 800, and 840. The relocated text in the proposed X50 and X90 does not address the proposed revisions of several PIs including PI-3645, PI-3650, PI-3654, PI-3660, PI-3661, PI-3663, PI-3666, and PI-3670, that have been submitted to consolidate the common requirements of the various 8xx.93 sections into a single new 800.93			

	Public Input No. 3360-NFPA 70-2	2023 [ Sections Part IV., 840.101	1
IFPA			
	Sections Part IV., 840.101		
	Part IV. Grounding Methods		
	840.101 Premises Circuits Not Leaving	<del>; the Building.</del>	
	If the network terminal is served by a no current-carrying metal member of a con- joint or equivalent device, and circuits th contained within the building (i.e., they c apply, as applicable.	onconductive optical fiber cable, or where ductive optical fiber cable is interrupted l nat terminate at the network terminal are do not exit the building), 840.101(A), (B)	<del>) any non-</del> <del>∋y an insulating</del> <del>completely</del> ) <del>, or (C) shall</del>
	(A) Coaxial Cable Shield Grounding.		
	The shield of coaxial cable shall be grou	nded by one of the following:	
	(1) Any of the methods described in 82	20.100 -or 800.106	
	(2) A fixed connection to an equipment	grounding conductor as described in 25	<del>;0.118</del>
	(3) Connection to the network terminal connected to ground by one of the r equipment grounding conductor thro ground connection if the network ter	grounding terminal provided that the terr nethods described in 820.100 -or 800.1 ough a listed grounding device that will re rminal is unplugged	<del>ninal is</del> I <del>06 , or to an</del> etain the
	(B) - Communications Circuit Grounding	<del>.</del>	
	Communications circuits shall not be rec	<del>quired to be grounded.</del>	
	(C) - Network Terminal Grounding.		
	The network terminal shall not be require coaxial cable shield is separately ground the use of a cord and plug for the connec be permitted.	ed to be grounded unless required by its led as described in 840.101(A)(1) or 84 ction to the network terminal grounding o	<del>-listing. If the</del> <del>10.101(A)(2) ,</del> connection shall
	Informational Note: If required to t equipment grounding conductor fro grounding terminal is permitted. Si is covered in Table 250.122 .	be grounded, a listed device that extends om the receptacle to the network termina zing of the extended equipment groundi	<del>} the</del> <del>≀l equipment</del> <del>ng conductor</del>
ddit	tional Proposed Changes		
	File Name	<b>Description</b>	Approve
Li	imited_Energy_TG_Substantiation.docx	Limited Energy TG Chair Substantiation	
state	ement of Problem and Substantia	tion for Public Input	
As Lii	s part of the work by the Limited Energy To imited Energy Grounding, Bonding, and Pr	G, the section is deleted as it is relocated rimary Protective Article.	d into the new
	nittor Information Varification		
Subn			

Organization Street Addre City: State: Zip:	: Minneapolis Electrical JATC ss:
Submittal Da	te: Fri Sep 01 14:31:13 EDT 2023
Committee:	NEC-P16
Committee Sta	atement
Resolution:	For clarity and ease-of-use, it is more appropriate to have as many requirements as practical for communications systems explicitly in one article such as 840 and not spread between X00, X50, X90, 800, and 840.



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	Submittal Da	ate: Thu Jun 22 05:02:11 EDT 2023	
	Committee:	NEC-P16	
Co	Committee Statement		
	<b>Resolution:</b>	FR-7783-NFPA 70-2024	
	Statement:	The cable substitution hierarchies have been incorporated into the general article, Article 800. This revision coordinates with action taken on 800.154 by deleting the cable substitution requirements from this Article.	

Public Input No. 1132-NFPA 70-2023 [ Part VI. ]			
Part ₩ V. Prer	nises Powering of Communications Equipment over Communications Cables		
Statement of Probl	em and Substantiation for Public Input		
It seems that Part V VII should have bec	of Article 840 was omitted, so Part VI should have become Part V and then Part come Part VI.		
Submitter Informat	ion Verification		
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Organization:	NWEJATC		
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Zin <sup>.</sup>			
Submittal Date:	Mon Jun 19 17:38:39 EDT 2023		
Committee:	NEC-P16		
Committee Statem	ent		
Resolution: FR-78	313-NFPA 70-2024		
Statement: Article	Part numbers have been revised to appear sequentially per the NEC style manual		

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Public Input No. 1134-NFPA 70-2023 [ Part VII. ]			
Part <del>VII</del> <u>VI</u> . Lis	ting Requirements		
Statement of Probl	em and Substantiation for Public Input		
It seems that Part V VII should have bec	of Article 840 was omitted, so Part VI should have become Part V and then Part come Part VI.		
Submitter Informat	ion Verification		
Submitter Full Nan	ne: Josh McKinley		
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Submittal Date:	Mon Jun 19 17:47:38 EDT 2023		
Committee:	NEC-P16		
Committee Statem	ent		
<b>Resolution:</b> <u>FR-78</u> <b>Statement:</b> Article	313-NFPA 70-2024 Part numbers have been revised to appear sequentially per the NEC style manual.		