Public Comment No. 1959-NFPA 70-2021 [Global Input]

A task group has been established consisting of members from CMP-5, CMP-7 and CMP-17 to review and correlate the definition and use of the term "Equipotential Plane". While construction of the "equipotential plane" may vary, the definition and objective is the same. The task group is to consider development of public comments which will ensure a coordinated approach for the definitions and applications of "equipotential plane" in accordance with section 2.2.2.4 of the NEC Style Manual.

Additional Proposed Changes

File Name	Description	Approved
CN_315_Global.pdf	70_CN315	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 315 appeared in the First Draft Report.

A task group has been established consisting of members from CMP-5, CMP-7 and CMP-17 to review and correlate the definition and use of the term "Equipotential Plane". While construction of the "equipotential plane" may vary, the definition and objective is the same. The task group is to consider development of public comments which will ensure a coordinated approach for the definitions and applications of "equipotential plane" in accordance with section 2.2.2.4 of the NEC Style Manual.

Related Item

• Correlating Note No. 315

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:33:07 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 315-NFPA 70-2021 [Global Input]

Submitter Information Verification

Committee:

Submittal Date: Thu May 06 15:35:18 EDT 2021

Committee Statement

Committee Statement: A task group has been established consisting of members from CMP-5, CMP-7 and CMP-17 to review and correlate the definition and use of the term “Equipotential Plane”. While construction of the “equipotential plane” may vary, the definition and objective is the same. The task group is to consider development of public comments which will ensure a coordinated approach for the definitions and applications of “equipotential plane” in accordance with section 2.2.2.4 of the NEC Style Manual.

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 768-NFPA 70-2021 [Global Input]

The Correlating Committee directs the panel to review the proposed 555.35(C)(2) Exception reference to low-voltage contact limit as defined in 680.2. The CC directs CMP-7 to remove the reference to 680.2 due to the definition being moved to Article 100.

The Correlating Committee directs CMP-7 to review the language used in 555.35(C) for the accurate use of ground fault protection. GFCI is defined in Article 100 as "Class A" and the phrase "Class A GFCI protection for personnel" is used as compared to 555.35(D) where "GFCI protection for personnel" and "GFCI protected" phrases are used.

Additional Proposed Changes

File Name	Description	Approved
7_CN_316_Global.pdf	7 CN316	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 316 appeared in the First Draft Report on First Revision No. 7917.

The Correlating Committee directs the panel to review the proposed 555.35(C)(2) Exception reference to low-voltage contact limit as defined in 680.2. The CC directs CMP-7 to remove the reference to 680.2 due to the definition being moved to Article 100.

The Correlating Committee directs CMP-7 to review the language used in 555.35(C) for the accurate use of ground fault protection. GFCI is defined in Article 100 as "Class A" and the phrase "Class A GFCI protection for personnel" is used as compared to 555.35(D) where "GFCI protection for personnel" and "GFCI protected" phrases are used.

Related Item

- First Revision No. 7917

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:09:14 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 316-NFPA 70-2021 [Global Input]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 15:37:52 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to review the proposed 555.35(C)(2) Exception reference to low-voltage contact limit as defined in 680.2. The CC directs CMP-7 to remove the reference to 680.2 due to the definition being moved to Article 100.

The Correlating Committee directs CMP-7 to review the language used in 555.35(C) for the accurate use of ground fault protection. GFCI is defined in Article 100 as "Class A" and the phrase "Class A GFCI protection for personnel" is used as compared to 555.35(D) where "GFCI protection for personnel" and "GFCI protected" phrases are used.

First Revision No. 7917-NFPA 70-2020 [Global Input]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 820-NFPA 70-2021 [Global Input]

The Correlating Committee directs the Chair of CMP-7 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.

Additional Proposed Changes

File Name	Description	Approved
7_CN_356_Global.pdf	7 CN356	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 356 appeared in the First Draft Report on First Revision No. 7690.

The Correlating Committee directs the Chair of CMP-7 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.

Related Item

- First Revision No. 7690

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 12:34:23 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 356-NFPA 70-2021 [Global Input]

Supplemental Information

File Name	Description	Approved
NEC_P07_Definitions_TG_Attachment_CN356.docx		

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 22:38:41 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Chair of CMP-7 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.

First Revision No. 7690-NFPA 70-2020 [Global Input]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Correlating Committee Definitions Task Group
CMP-7 - Definitions

CMP-7 Definitions	Correlating Committee Comments
	The Correlating Committee directs the Chair of CMP-7 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.
Air-Conditioning or Comfort-Cooling Equipment. All of that equipment intended or installed for the purpose of processing the treatment of air so as to control simultaneously or individually its temperature, humidity, cleanliness, and distribution to meet the requirements of the conditioned space. (555) (CMP-7)	The Correlating Committee request that this definition be reviewed by the panel for accuracy. The term is not located in Article 555 or 551. The term Air-Conditioning is well understood. The term Comfort-Cooling Equipment is only located in the definition. The definition should be considered for deletion.
Building, Floating. (Floating Building). A building unit, as defined in Article 100, that floats on water, is moored in a permanent location, and has a premises wiring system served through connection by permanent wiring to an electrical supply system not located on the premises. (555) (CMP-7)	The Correlating Committee directs that the definition be revised to reflect that this definition now resides in Article 100. The panel should consider removing the words "unit, as defined in Article 100" for clarity.
Equipotential Plane (as applied to agricultural buildings). An area where wire mesh or other conductive elements are embedded in or placed under concrete, bonded to all metal structures and fixed nonelectrical equipment that could become energized, and connected to the electrical grounding system to minimize voltage differences within the plane and between the planes, the grounded equipment, and the earth. (547) (CMP-7)	2.2.2.4 Multiple Terms TG by others CMP 5-7-17 Possible Requirements
Feeder, Recreational Vehicle Site. (Recreational Vehicle Site Feeder). The conductors between the park service equipment and the recreational vehicle site supply equipment. (551) (CMP-7)	The Correlating Committee directs the panel to review the need for this definition. The definition for the term feeder would apply. The defined term is not used within the article.
Manufactured Home. A structure, transportable in one or more sections, which in the traveling mode is 2.4 m (8 ft) or more in width or 12.2 m (40 ft) or more in length, or when erected on site is 29.77 m2 (320 ft2) or more is built on a permanent chassis and is designed to be used as a dwelling with or without a permanent foundation, whether or not connected to the utilities, and	4.3.2.2 Extracted Context This def. does not meet SM Needs to be revise to comply Def. Last line does not reflect definition location.

includes plumbing, heating, air conditioning, and electrical systems contained therein. The term manufactured home includes any structure that meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the regulatory agency. Calculations used to determine the number of square meters (square feet) in a structure are based on the structure's exterior dimensions and include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows. [501:1.2.13] For the purpose of this Code and unless otherwise indicated, the term mobile home includes manufactured homes and excludes park trailers defined in 552.4. (CMP-7) Informational Note No. 1: See the applicable building code for definition of the term permanent foundation. Informational Note No. 2: See 24 CFR Part 3280, Manufactured Home Construction and Safety Standards, of the Federal Department of Housing and Urban Development, for additional information on the definition.	The Correlating Committee directs the panel to review the extracted definition for accuracy and to consider moving the sentence after the extracted term to an Informational Note.
Appliance, Fixed. (Fixed Appliance). An appliance that is fastened or otherwise secured at a specific location. (CMP-7)	Task Group 3 Appliances-Equipment-Portable Issues
Appliance, Portable. (Portable Appliance). An appliance that is actually moved or can easily be moved from one place to another in normal use. (550) (CMP-7) Informational Note: For the purpose of this article, the following major appliances, other than built-in, are considered portable if cord connected: refrigerators, range equipment, clothes washers, dishwashers without booster heaters, or other similar appliances.	Task Group 3 Appliances-Equipment-Portable Issues Is this being used in Art. 550?
Dead Front (as applied to switches, circuit breakers, switchboards, and panelboards). Designed, constructed, and installed so that no current-carrying parts are normally exposed on the front. (551) (CMP-7)	Task Group 5 Dead Front 2.2.2.4 Multiple Terms
Disconnecting Means, Recreational Vehicle. (Recreational Vehicle Disconnecting Means) The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in a recreational vehicle and intended to constitute the means of cutoff for the supply to that recreational vehicle. (551) (CMP- 7)	Task Group 9 Disconnecting Means 2.2.2.4 Multiple Terms
Electrical Datum Plane. A specified distance above the normal highwater water level above which electrical equipment can be installed and electrical connections can be made. (CMP-7)	Task Group 13 Electrical Datum Plane - Normal High Water Level

Normal High Water Level (as applies to electrical datum plane distances). An elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. (CMP-7)	Task Group 13 Electrical Datum Plane - Normal High Water Level
Power-Supply Assembly. The conductors, including ungrounded, grounded, and equipment grounding conductors, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panel within the recreational vehicle. (551) (CMP-7)	Task Group 8 Cord Connector - Power-Supply Cord 2.2.2.4 Multiple Terms
Berth. The water space to be occupied by a boat or other vessel alongside or between bulkheads, piers, piles, fixed and floating docks, or any similar access structure. (See also Slip.) [303:3.3.1] (555) (CMP-7)	4.3.2.3 Extract Reference
Boatyard. A facility used for constructing, repairing, servicing, hauling from the water, storing (on land and in water), and launching of boats. [303:3.3.2] (555) (CMP-7)	4.3.2.3 Extract Reference
Bulkhead. A vertical structural wall, usually of stone, timber, metal, concrete, or synthetic material, constructed along, and generally parallel to, the shoreline to retain earth as an extension of the upland, and often to provide suitable water depth at the waterside face. [303:3.3.4] (555) (CMP-7)	4.3.2.3 Extract Reference
Crane. A mechanical device used for lifting or moving boats. [303:3.3.5] (555) (CMP-7)	4.3.2.3 Extract Reference Generic Term, Needed?
Distribution Point. An electrical supply point from which service drops, service conductors, feeders, or branch circuits to buildings or structures utilized under single management are supplied. (547) (CMP-7) Informational Note No. 1: Distribution points are also known as the center yard pole, meter pole, or the common distribution point. Informational Note No. 2: The service point as defined in Article 100 is typically at the distribution point.	2.2.2.5 Alternate Terms Can be included in the title instead of an IN 4.1.3 Informational Note Structure
Docking Facility. A covered or open, fixed or floating structure that provides access to the water and to which boats are secured. [303:3.3.6] (555) (CMP-7)	4.3.2.3 Extract Reference
Frame. (as applies to Recreational Vehicles). Chassis rail and any welded addition thereto of metal thickness of 1.35 mm (0.053 in.) or greater. (551) (CMP-7)	2.2.2.2 Requirement In Definition 2.2.2.3.2 Article Number (as applied....)

Low Voltage. (as applies to Recreational Vehicles). An electromotive force rated 24 volts, nominal, or less. (551) (CMP-7)	2.2.2.3.2 Article (as applies to....)
Marina. A facility, generally on the waterfront, that stores and services boats in berths, on moorings, and in dry storage or dry stack storage. [303:3.3.12] (555) (CMP-7)	4.3.2.3. Extract Reference
Mobile Home. A factory-assembled structure or structures transportable in one or more sections that are built on a permanent chassis and designed to be used as a dwelling without a permanent foundation where connected to the required utilities and that include the plumbing, heating, air-conditioning, and electrical systems contained therein. For the purpose of this Code and unless otherwise indicated, the term mobile home includes manufactured homes. (CMP-7)	2.2.2.5 Alternate Term Pick One Manufactured or Mobile Home and use synonym
Mobile Home Accessory Building or Structure. Any awning, cabana, ramada, storage cabinet, carport, fence, windbreak, or porch established for the use of the occupant of the mobile home on a mobile home lot. (550) (CMP-7)	2.2.2.5 Alternate Term (Mobile Home Accessory Structure)
Monorail. Overhead track and hoist system for moving material around the boatyard or moving and launching boats. [303:3.3.15] (555) (CMP-7)	4.3.2.3. Extract Reference
Mooring(s). Any place where a boat is wet stored or berthed. [303:3.3.16] (555) (CMP-7)	4.3.2.3. Extract Reference
Motor Home. This definition shall apply only within this article. A vehicular unit designed to provide temporary living quarters for recreational, camping, or travel use built on or permanently attached to a self-propelled motor vehicle chassis or on a chassis cab or van that is an integral part of the completed vehicle. (See Recreational Vehicle.) (551) (CMP-7)	2.2.2.5 Alternate Terms (Recreational Vehicle) Within this Article
Pier. A structure extending over the water and supported on a fixed foundation (fixed pier), or on flotation (floating pier), that provides access to the water. [303:3.3.17] (CMP-7)	4.3.2.3. Extract Reference
Pier, Fixed. Pier constructed on a permanent, fixed foundation, such as on piles, that permanently establishes the elevation of the structure deck with respect to land. [303:3.3.17.2] (CMP-7)	2.2.2.3.1 Searchable Title Searchable: (Fixed Pier) 4.3.2.3. Extract Reference
Pier, Floating. Pier designed with inherent flotation capability that allows the structure to float on the water surface and rise and fall with water level changes. [303:3.3.17.3] (CMP-7)	2.2.2.3.1 Searchable Title Searchable: (Floating Pier) 4.3.2.3. Extract Reference

Power Outlet, Marina. An enclosed assembly that can include equipment such as receptacles, circuit breakers, fused switches, fuses, a watt-hour meter(s), panelboards, and monitoring means identified for marina use. [303:3.3.13] (555) (CMP-7)	2.2.2.3.1 Searchable Title Searchable: (Marina Power Outlet) 4.3.2.3. Extract Reference
Recreational Vehicle. A vehicle or slide-in camper that is primarily designed as temporary living quarters for recreational, camping, or seasonal use; has its own motive power or is mounted on or towed by another vehicle; is regulated by the National Highway Traffic Safety Administration as a vehicle or vehicle equipment; does not require a special highway use permit for operation on the highways; and can be easily transported and set up on a daily basis by an individual. [1192:3.3.53] (551) (CMP-7) Informational Note: The basic entities are travel trailer, camping trailer, truck camper, and motor home as referenced in NFPA 1192-2021, Standard on Recreational Vehicles. See 3.3.52, Recreational Vehicle, and A.3.3.52 of NFPA 1192.	4.1.3 Informational Note Structure 4.3.2.3. Extract Reference 3.2.3 Acronym (consider)
Slip. A berthing space between or adjacent to piers, wharves, or docks; the water areas associated with boat occupation. (See also Berth.) [303:3.3.20] (555) (CMP-7)	2.2.2.5 Alternate Term 4.3.2.3. Extract Reference
Storage, Dry Stack. A facility, either covered or uncovered, constructed of horizontal and vertical structural members designed to allow placement of small boats in defined slots arranged both horizontally and vertically. [303:3.3.23.2] (555) (CMP-7)	4.3.2.3 Extracted Reference Used in the definition of Marina
Trailer, Camping. (Camping Trailer). A vehicular portable unit mounted on wheels and constructed with collapsible partial side walls that fold for towing by another vehicle and unfold at the campsite to provide temporary living quarters for recreational, camping, or travel use. (See Recreational Vehicle.) (551) (CMP-7)	2.2.2.5 Alternate Terms Suggest an Informational Note to include RV
Travel Trailer. A vehicular unit, mounted on wheels, designed to provide temporary living quarters for recreational, camping, or travel use, of such size or weight as not to require special highway movement permits when towed by a motorized vehicle, and of gross trailer area less than 30 m2 (320 ft2). (See Recreational Vehicle.) (551) (CMP-7)	2.2.2.5 Alternate Terms Suggest an Informational Note to include RV
Truck Camper. A portable unit constructed to provide temporary living quarters for recreational, travel, or camping use, consisting of a roof, floor, and sides, designed to be loaded onto and unloaded from the bed of a pickup truck. (See Recreational Vehicle.) (551) (CMP-7)	2.2.2.5 Alternate Terms Suggest an Informational Note to include RV
Wharf. A structure at the shoreline that has a platform built along and parallel to a body of water with either an open deck or a superstructure. [307:3.3.24] (555) (CMP-7)	4.3.2.3. Extract Reference

Public Comment No. 903-NFPA 70-2021 [Global Input]

A task group has been established consisting of members from CMPs 7 and 17 to review and correlate the use of the term "datum plane" in 682.12 (FR 8701) and 555.30 (FR 7929) as well as 682.11 (FR 8697) and 555.4 (FR7911) for consistent use.

Additional Proposed Changes

File Name	Description	Approved
CN_314_Global.pdf	70_CN314	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 314 appeared in the First Draft Report.

A task group has been established consisting of members from CMPs 7 and 17 to review and correlate the use of the term "datum plane" in 682.12 (FR 8701) and 555.30 (FR 7929) as well as 682.11 (FR 8697) and 555.4 (FR7911) for consistent use.

Related Item

• Correlating Note No. 314

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 16:02:59 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 314-NFPA 70-2021 [Global Input]

Submitter Information Verification

Committee:

Submittal Date: Thu May 06 15:31:42 EDT 2021

Committee Statement

Committee Statement: A task group has been established consisting of members from CMPs 7 and 17 to review and correlate the use of the term “datum plane” in 682.12 (FR 8701) and 555.30 (FR 7929) as well as 682.11 (FR 8697) and 555.4 (FR7911) for consistent use.

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1981-NFPA 70-2021 [Definition: Air-Conditioning or Comfort-Cooling Equipment.]

Air-Conditioning or Comfort-Cooling Equipment.

All of that equipment intended or installed for the purpose of processing the treatment of air so as to control simultaneously or individually its temperature, humidity, cleanliness, and distribution to meet the requirements of the conditioned space. (555) (CMP-7)

Additional Proposed Changes

File Name	Description	Approved
CN_422.pdf	70_CN422	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 422 appeared in the First Draft Report on First Revision No. 7690.

The Correlating Committee request that this definition be reviewed by the panel for accuracy. The term is not located in Article 555. The term Air-Conditioning is well understood. The term Comfort-Cooling Equipment is only located in the definition. The definition should be considered for deletion.

Related Item

- First Revision No. 7690

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 21:23:37 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 422-NFPA 70-2021 [Definition: Air-Conditioning or Comfort-Cooling Equipment.]

Submitter Information Verification

Committee: NEC-AAC
Submittal Date: Sun May 09 22:01:21 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee request that this definition be reviewed by the panel for accuracy. The term is not located in Article 555. The term Air-Conditioning is well understood. The term Comfort-Cooling Equipment is only located in the definition. The definition should be considered for deletion.

First Revision No. 7690-NFPA 70-2020 [Global Input]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1983-NFPA 70-2021 [Definition: Building, Floating. (Floating Building)]

Building, Floating. (Floating Building)

A building unit, as defined in Article 100, that floats on water, is moored in a permanent location, and has a premises wiring system served through connection by permanent wiring to an electrical supply system not located on the premises. (555) (CMP-7)

Additional Proposed Changes

File Name	Description	Approved
CN_423.pdf	70_CN423	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 423 appeared in the First Draft Report on First Revision No. 7690.

The Correlating Committee directs that the definition be revised to reflect that this definition now resides in Article 100. The panel should consider removing the words "unit, as defined in Article 100" for clarity.

Related Item

• First Revision No. 7690

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 21:29:04 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 423-NFPA 70-2021 [Definition: Floating Building., Floating. (Floating Buildin...]

Submitter Information Verification

Committee: NEC-AAC
Submittal Date: Sun May 09 22:06:05 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that the definition be revised to reflect that this definition now resides in Article 100. The panel should consider removing the words "unit, as defined in Article 100" for clarity.

First Revision No. 7690-NFPA 70-2020 [Global Input]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 347-NFPA 70-2021 [Definition: Building, Floating. (Floating Building)]

Building, Floating. (Floating Building)

A building unit, as defined in Article 100, that floats on water, is moored in a permanent location, and has a premises wiring system served through connection by permanent wiring to an electrical supply system not located on the premises. (~~555~~) (CMP-7)

Statement of Problem and Substantiation for Public Comment

The reference to Article 555 should be deleted as the term floating building is not limited to Article 555. It is also used in Article 90 in the Scope. Section .2(A) and .2(B) identifies what is covered and not covered in the NEC. With the definition now being in Article 100, if one wants to know how the NEC defines a floating building, Article 100 can be referenced. If the definition in Article 100 is limited to Article 555, then the term floating building in Article 90.2(A) and (B) is left open. A floating building could be a barge, cruise ship, dredge, casino boat, etc.

Article 555 is not built around the definition of a floating building. A floating building is the definition of a type of building that may or may not be included as a part of Article 555.

Related Item

• Correlating Committee Note No. 423-NFPA 70-2021 [Definition: Floating Building., Floating. (Floating Buildin...]

Submitter Information Verification

Submitter Full Name: Roger Zieg
Organization: NTT
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jul 24 10:55:18 EDT 2021
Committee: NEC-P07

Public Comment No. 1260-NFPA 70-2021 [Definition: Dead Front (as applied to switches, circuit bre...]

~~**Dead Front (as applied to switches, circuit breakers, switchboards, and panelboards).**~~

~~Designed, constructed, and installed so that no current-carrying parts are normally exposed on the front. (551) (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

The code-wide definition conveys the concept well enough that Article 551 does not need its own definition. With the relocation to Article 100 it can no longer be argued that those effected by Article 551 only read Article 551 and not the rest of the code.

Related Item

• FR 8496

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 11 14:23:04 EDT 2021
Committee: NEC-P07

Public Comment No. 303-NFPA 70-2021 [Definition: Dead Front (as applied to switches, circuit bre...]

~~**Dead Front (as applied to switches, circuit breakers, switchboards, and panelboards).**~~

~~Designed, constructed, and installed so that no current-carrying parts are normally exposed on the front. (551) (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair and Dean Hunter (CMP 7). The task group was assigned the following charge.

The Correlating Committee notes that more than one related term is being used for “Dead Front.” Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. Therefore, the Correlating Committee established a Task Group to consider one definition for correlation. Additionally, the Correlating Committee assigned the definition of "Dead Front" to CMP-9.

The task group has concluded the definition for “Dead Front” which appears in Article 551 of the 2020 NEC is not needed. “Dead Front” is used in only one section of the Article (551.46(C)) other than in the definition. Article 550 uses the term in basically the same context, and in this Article there is no unique definition for “Dead Front.” The Article 100 definition adequately covers the dead front panelboard, switchboard and disconnect device installation. This generic definition is sufficient to cover all uses of the term throughout the code. Therefore, it is proposed to leave the Panel 9 definition for “Dead Front” unchanged and delete the definition of “Dead Front” which appears in Article 551 of the 2020 NEC. This definition was proposed to move to Article 100 for the 2023 NEC with FR 9274 (Global Input).

Related Item

• FR 9274 (Global Input)

Submitter Information Verification

Submitter Full Name: John Kovacik
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 19 23:09:17 EDT 2021
Committee: NEC-P07

Public Comment No. 1263-NFPA 70-2021 [Definition: Disconnecting Means, Recreational Vehicle. (Rec...]

~~**Disconnecting Means, Recreational Vehicle. (Recreational Vehicle Disconnecting Means)**~~

~~The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in a recreational vehicle and intended to constitute the means of cutoff for the supply to that recreational vehicle. (551) (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

The code-wide definition of "disconnecting means" covers the issue well enough. Because the definition is no longer in Article 551 it cannot be argued that people that read Article 551 only read Article 551 and not the remainder of the code. Furthermore, the language discussing the location of the disconnecting means seems to be a requirement and therefore does not comply with the style manual.

Related Item

- FR 8496

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 11 14:28:41 EDT 2021
Committee: NEC-P07

Public Comment No. 458-NFPA 70-2021 [Definition: Disconnecting Means, Recreational Vehicle. (Rec...]

~~**Disconnecting Means, Recreational Vehicle. (Recreational Vehicle Disconnecting Means)**~~

~~The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in a recreational vehicle and intended to constitute the means of cutoff for the supply to that recreational vehicle. (551) (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair, Mike Stone (CMP 1) and Dean Hunter (CMP 7). The task group was assigned the following charge. The Correlating Committee notes that more than one related term is being used for “Disconnecting Means.” Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. Therefore, the Correlating Committee established a Task Group to consider one definition for correlation. Additionally, the Correlating Committee assigned the definition of "Disconnecting Means" to CMP-1.

The task group has concluded the definition for “Disconnecting Means (for Recreational Vehicles)” which appears in Article 551 and the definition for “Disconnecting Means, Parking space” which appears in Article 626 of the 2020 NEC are not needed.

The term “Disconnecting Means” appears in several locations in Article 551. The use of the term in these locations was found to be inaccurate if we are only referring to the disconnecting means inside of the recreational vehicle as the definition states. It was determined that the generic definition of “Disconnecting Means” in Article 100 is sufficient to address the use of the term “Disconnecting Means” in Article 551.

The term “Disconnecting Means, Parking Space” appears in only one location in Article 626 (626.24(C)). Upon review of the use of the term in that location, it was determined that the generic definition of “Disconnecting Means” in Article 100 is sufficient to address the use of the term “Disconnecting Means, Parking Space.”

The Article 100 definition of “Disconnecting Means” is sufficient to cover all uses of the term throughout the code. Therefore, it is proposed to leave the Panel 1 definition of “Disconnecting Means” unchanged and delete the definition of “Disconnecting Means” which appears in Article 551 and the definition for “Disconnecting Means, Parking space” which appears in Article 626 of the 2020 NEC. These definitions were proposed to be revised and moved to Article 100 for the 2023 NEC with FR 9274 (Global Input).

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 454-NFPA 70-2021 [Definition: Disconnecting Means, Parking Space. (Parking Sp...]	
Public Comment No. 454-NFPA 70-2021 [Definition: Disconnecting Means, Parking Space. (Parking Sp...]	

Related Item

- FR 9274 (Global Input)

Submitter Information Verification

Submitter Full Name: John Kovacik
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 27 17:03:31 EDT 2021
Committee: NEC-P07

Public Comment No. 1264-NFPA 70-2021 [Definition: Electrical Datum Plane.]

~~**Electrical Datum Plane.**~~

~~A specified distance above the normal highwater level which electrical equipment can be installed and electrical connections can be made. (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

This is a duplicate definition.

Related Item

• FR 8496

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 11 14:30:27 EDT 2021
Committee: NEC-P07

Public Comment No. 473-NFPA 70-2021 [Definition: Electrical Datum Plane.]

Electrical Datum Plane.

A specified ~~distance~~ vertical distance above the normal highwater level elevation which electrical equipment can be installed and electrical connections can be made. (CMP-7)

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-13) appointed by the Correlating Committee. This task group consisted Mike Querry (CMP-17) and Dean Hunter (CMP-7) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 7 and 17 to review the following definition for revisions and look at possibly combining similar definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual. These definitions were proposed to be revised and moved to Article 100 for the 2023 NEC with FR 9274 (Global Input).

Related Item

• FR 9274

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 08:37:09 EDT 2021
Committee: NEC-P07

Public Comment No. 1112-NFPA 70-2021 [Definition: Equipotential Plane (as applied to agricultural...]

Equipotential Plane (as applied to agricultural buildings).

An area where wire mesh or other conductive elements are embedded in or placed under concrete, bonded to all metal structures and fixed nonelectrical equipment that could become energized, and connected to the electrical grounding system to minimize voltage differences within the plane and between the planes, the grounded equipment, and the earth. (547) (CMP-7)

Additional Proposed Changes

File Name	Description	Approved
17_CN_450.pdf	70_CN450	

Statement of Problem and Substantiation for Public Comment

The following CC Note No. 450 appeared in the First Draft Report on First Revision No. 8571.

The Correlating Committee assigns the definition of "equipotential plane" to CMP-7.

Related Item

- First Revision No. 8571

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 09 15:23:04 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 450-NFPA 70-2021 [Definition: Equipotential Plane.]

Submitter Information Verification

Committee: NEC-P17
Submittal Date: Mon May 10 14:07:07 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee assigns the definition of “equipotential plane” to CMP-7.

First Revision No. 8571-NFPA 70-2021 [Definition: Equipotential Plane.]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 472-NFPA 70-2021 [Definition: Equipotential Plane.]

Equipotential Plane.

~~Conductive parts~~ An area where conductive elements are embedded in or placed under concrete, paving, or unpaved surfaces, and bonded together to ~~reduce voltage gradients in a designated area. (682) (CMP-17~~ minimize voltage differences within the plane and between the planes, the grounded equipment, and the earth. (CMP-7)

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-13) appointed by the Correlating Committee. This task group consisted Mike Querry (CMP-17) and Dean Hunter (CMP-7) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 7 and 17 to review the following definition for revisions and look at possibly combining similar definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual. These definitions were proposed to be revised and moved to Article 100 for the 2023 NEC with FR 9274 (Global Input).

Related Item

• FR 9274

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 08:29:58 EDT 2021
Committee: NEC-P07

Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]

Feeder Assembly.

The overhead or under-chassis feeder conductors, including the equipment grounding conductor, together with the necessary fittings and equipment; or ~~a power~~ the power -supply cord ~~listed~~ assembly for a mobile home ~~use~~ , recreational vehicle, or park trailer, identified for the delivery of energy from the source of electrical supply to the panelboard within the mobile home, recreational vehicle, or park trailer . ~~(550) (~~ CMP-7)

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair, Dave Watson, (CMP 6) and Dean Hunter (CMP 7). The task group was assigned the following charge. The Correlating Committee notes that more than one related term is being used for "Power-Supply Cord." Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. In addressing the multiple definitions for power supply cord, the task group identified a correlation issue relative to the use of the terms "Power-Supply Assembly" and "Feeder Assembly".

The definition for "Power-Supply Assembly" is specific to Article 551, "Feeder Assembly" is a defined term used in Article 550, which is very similar to the term "Power-Supply Assembly" as used in Articles 551 and 552. To eliminate some correlation issues when using these two different terms within articles under CMP-7 purview, it would make sense to modify the existing definition for "Feeder Assembly" and exchange the term "Power-Supply Assembly" with "Feeder Assembly" where it is used in Articles 551 and 552. The task group is recommending to delete the definition for "Power-Supply Assembly", and combine the definition for "Power-Supply Assembly" with "Feeder Assembly". Additionally, term "Power-Supply Assembly" would be replaced with the term with "Feeder Assembly" where it is used in Articles 551 and 552.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]	Definition for a related term
Public Comment No. 1869-NFPA 70-2021 [Article 551]	Definition for a related term
Public Comment No. 1874-NFPA 70-2021 [Article 552]	Definition for a related term
Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]	
Public Comment No. 1869-NFPA 70-2021 [Article 551]	
Public Comment No. 1874-NFPA 70-2021 [Article 552]	

Related Item

- FR 9274 (Global Input)

Submitter Information Verification

Submitter Full Name: John Kovacik
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 01:18:14 EDT 2021
Committee: NEC-P07

Public Comment No. 823-NFPA 70-2021 [Definition: Feeder, Recreational Vehicle Site. (Recreationa...]

Feeder, Recreational Vehicle Site. (Recreational Vehicle Site Feeder)

The conductors between the park service equipment and the recreational vehicle site supply equipment. (551) (CMP-7)

Additional Proposed Changes

File Name	Description	Approved
7_CN_424.pdf	7 CN424	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 424 appeared in the First Draft Report on First Revision No. 7822.

The Correlating Committee directs the panel to review the need for this definition. The definition for the term feeder would apply. The defined term is not used within the article.

Related Item

- First Revision No. 7822

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 12:47:59 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 424-NFPA 70-2021 [Definition: Recreational Vehicle Site Feeder Circuit Conduc...]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Sun May 09 22:08:37 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to review the need for this definition. The definition for the term feeder would apply. The defined term is not used within the article.

First Revision No. 7822-NFPA 70-2020 [Definition: Recreational Vehicle Site Feeder Circuit Conduc...]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1265-NFPA 70-2021 [Definition: Frame (as applies to recreational vehicles).]

Frame (as ~~applies to~~ applied to recreational vehicles).

Chassis rail and any welded addition thereto of metal thickness of 1.35 mm (0.053 in.) or greater. (551) (CMP-7)

Statement of Problem and Substantiation for Public Comment

Fixing a typo.

Related Item

• FR 7690

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 11 14:34:00 EDT 2021
Committee: NEC-P07

Public Comment No. 1984-NFPA 70-2021 [Definition: Manufactured Home.]

Manufactured Home.

A structure, transportable in one or more sections, which in the traveling mode is 2.4 m (8 ft) or more in width or 12.2 m (40 ft) or more in length, or when erected on site is 29.77 m2 (320 ft2) or more is built on a permanent chassis and is designed to be used as a dwelling with or without a permanent foundation, whether or not connected to the utilities, and includes plumbing, heating, air conditioning, and electrical systems contained therein. The term *manufactured home* includes any structure that meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the regulatory agency. Calculations used to determine the number of square meters (square feet) in a structure are based on the structure's exterior dimensions and include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows. [**501:**1.2.13] For the purpose of this *Code* and unless otherwise indicated, the term mobile home includes manufactured homes and excludes park trailers defined in 552.4. (CMP-7)

Informational Note No. 1: See the applicable building code for definition of the term *permanent foundation*.

Informational Note No. 2: See 24 CFR Part 3280, *Manufactured Home Construction and Safety Standards, of the Federal Department of Housing and Urban Development*, for additional information on the definition.

Additional Proposed Changes

File Name	Description	Approved
CN_425.pdf	70_CN425	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 425 appeared in the First Draft Report on First Revision No. 7690.

The Correlating Committee directs the panel to review the extracted definition for accuracy and to consider moving the sentence after the extracted term to an Informational Note.

Related Item

• First Revision No. 7690

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 21:30:49 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 425-NFPA 70-2021 [Definition: Manufactured Home.]

Submitter Information Verification

Committee: NEC-AAC
Submittal Date: Sun May 09 22:09:55 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to review the extracted definition for accuracy and to consider moving the sentence after the extracted term to an Informational Note.

First Revision No. 7690-NFPA 70-2020 [Global Input]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 25-NFPA 70-2021 [Definition: Manufactured Home.]

Manufactured Home.

A structure, transportable in one or more sections, which in the traveling mode is 2.4 m (8 ft) or more in width or 12.2 m (40 ft) or more in length, or when erected on site is 29.77 m2 (320 ft2) or more, is built on a permanent chassis and is designed to be used as a dwelling with or without a permanent foundation, whether or not connected to the utilities, and includes plumbing, heating, air conditioning, and electrical systems contained therein. The term *manufactured home* includes any structure that meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the regulatory agency. Calculations used to determine the number of square meters (square feet) in a structure are based on the structure's exterior dimensions and include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows. [**501:**1.2.13] For the purpose of this *Code* and unless otherwise indicated, the term mobile home includes manufactured homes and excludes park trailers ~~defined in 552~~ . ~~4.~~ (CMP-7)

Informational Note No. 1: See the applicable building code for definition of the term *permanent foundation*.

Informational Note No. 2: See 24 CFR Part 3280, *Manufactured Home Construction and Safety Standards, of the Federal Department of Housing and Urban Development*, for additional information on the definition.

Statement of Problem and Substantiation for Public Comment

The comma is added to be gramatically correct. The reference to Park Trailers being defined in 552.4 is deleted because the term Park Trailer is now defined in Article 100.

Related Item

• FR-7690

Submitter Information Verification

Submitter Full Name: Phil Simmons
Organization: Simmons Electrical Services
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 29 19:56:24 EDT 2021
Committee: NEC-P07

Public Comment No. 26-NFPA 70-2021 [Definition: Mobile Home Park.]

Mobile Home Park.

A contiguous parcel of land that is used for the accommodation ~~of occupied mobile homes~~ of mobile homes that are intended to be occupied . (550) (CMP-7)

Statement of Problem and Substantiation for Public Comment

This is intended to be an editorial improvement of the existing definition. The underlying issue is, is the Mobile Home Park no longer in existence if the mobile (manufactured) homes happen to be unoccupied? The change seems to be a clarification.

Related Item

• PI-3013

Submitter Information Verification

Submitter Full Name: Phil Simmons
Organization: Simmons Electrical Services
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 29 20:11:30 EDT 2021
Committee: NEC-P07

Public Comment No. 474-NFPA 70-2021 [Definition: Normal High Water Level (as applies to electric...]

Normal High Water Level (as applies to electrical datum plane distances).

Natural or Artificially Made Shorelines : An elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial, or as determined by Federal Emergency Management Agency (FEMA), or a local governmental authority .

Rivers and Streams: The height of the high- water level is the elevation of the top of the bank of the channel. Streams, rivers and tributaries that are prone to flooding and effects of water runoff shall consider the " *b ankfull stage* " where an established gage height at a given location along a river or stream, above which a rise in water surface will cause the river or stream to overflow the lowest natural stream bank somewhere in the corresponding reach or as determined by Federal Emergency Management Agency (FEMA), or a local governmental authority.

Flood Control Bodies of Water: The flood pool maximum water surface elevation of a reservoir, equal to the elevation of the spillway or as determined by Federal Emergency Management Agency (FEMA), or a local governmental authority.

Non-flood Control Bodies of Water: The flowage easement boundary in which the highest water surface elevation defined by the area existing between governmental-owned property line(s) and a contour line with perpetual rights to flood the area in connection with the operation of the reservoir or as determined by Federal Emergency Management Agency (FEMA), or a local governmental authority. (CMP-7)

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-13) appointed by the Correlating Committee. This task group consisted Mike Querry (CMP-17) and Dean Hunter (CMP-7) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 7 and 17 to review the following definition for revisions and look at possibly combining similar definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual. These definitions were proposed to be revised and moved to Article 100 for the 2023 NEC with FR 9274 (Global Input). Also, the information regarding the different locations where the electrical datum plane distances would apply was added to the proposed language submitted in FR 7874 .

Related Item

• FR 9274 • FR 7875

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 08:39:52 EDT 2021
Committee: NEC-P07

Public Comment No. 774-NFPA 70-2021 [Definition: Normal High Water Level (as applies to electric...]

Normal High Water Level (as applies to electrical datum plane distances).

An elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. (CMP-7)

Additional Proposed Changes

File Name	Description	Approved
7_CN_319_Detail.pdf	7 CN319	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 319 appeared in the First Draft Report on First Revision No. 7875.

The Correlating Committee directs that this first revision be referred to CMP-17 for review of the use of the term "Normal High Water Mark" in Article 682 that was revised by CMP-7.

Related Item

- First Revision No. 7875

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:19:42 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 319-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 15:53:46 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that this first revision be referred to CMP-17 for review of the use of the term "Normal High Water Mark" in Article 682 that was revised by CMP-7.

First Revision No. 7875-NFPA 70-2020 [Detail]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]

~~**Power-Supply Assembly.**~~

~~The conductors, including ungrounded, grounded, and equipment grounding conductors, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panel within the recreational vehicle. (551) (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair, Dave Watson, (CMP 6) and Dean Hunter (CMP 7). The task group was assigned the following charge. The Correlating Committee notes that more than one related term is being used for “Power-Supply Cord.” Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. In addressing the multiple definitions for power supply cord, the task group identified a correlation issue relative to the use of the terms “Power-Supply Assembly” and “Feeder Assembly”.

The definition for “Power-Supply Assembly” is specific to Article 551, “Feeder Assembly” is a defined term used in Article 550, which is very similar to the term “Power-Supply Assembly” as used in Articles 551 and 552. To eliminate some correlation issues when using these two different terms within articles under CMP-7 purview, it would make sense to modify the existing definition for “Feeder Assembly” and exchange the term “Power-Supply Assembly” with “Feeder Assembly” where it is used in Articles 551 and 552. The task group is recommending to delete the definition for “Power-Supply Assembly”, and combine the definition for “Power-Supply Assembly” with “Feeder Assembly”. Additionally, term “Power-Supply Assembly” would be replaced with the term with “Feeder Assembly” where it is used in Articles 551 and 552.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]	Definition for a related term
Public Comment No. 1869-NFPA 70-2021 [Article 551]	Definition for a related term
Public Comment No. 1874-NFPA 70-2021 [Article 552]	Definition for a related term
Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]	
Public Comment No. 1869-NFPA 70-2021 [Article 551]	
Public Comment No. 1874-NFPA 70-2021 [Article 552]	

Related Item

- FR 9274 (Global Input)

Submitter Information Verification

Submitter Full Name: John Kovacik
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 00:34:51 EDT 2021
Committee: NEC-P07

Public Comment No. 73-NFPA 70-2021 [Definition: Recreational Vehicle Site Supply Equipment.]

Recreational Vehicle Site Supply Equipment.

The necessary equipment, usually a power outlet, consisting of a circuit breaker(s) or switch(es) and fuse(s) and their accessories, located near the point of entrance of supply conductors to a recreational vehicle site and intended to constitute the disconnecting means for ~~the supply to that site~~ connected recreational vehicles . (551) (CMP-7)

Statement of Problem and Substantiation for Public Comment

This Comment is intended to be an editorial improvement rather than a substantive change. It add parentheticals to indicate that often the power outlet contains more than one circuit breaker, switch or fuse.
In reality, the site supply equipment does not disconnect power to the site, that is done by overcurrent devices or disconnecting means at the origination of the feeder or branch circuit. The site disconnecting means acts to disconnect supplied recreational vehicles. This disconnecting means is required in 551.77(B).

Related Item

• PI-3013

Submitter Information Verification

Submitter Full Name: Phil Simmons
Organization: Simmons Electrical Services
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 01 14:39:39 EDT 2021
Committee: NEC-P07

Public Comment No. 1276-NFPA 70-2021 [Definition: Recreational Vehicle Stand.]

~~**Recreational Vehicle Stand.**~~

~~That area of a recreational vehicle site intended for the placement of a recreational vehicle. (551) (CMP-7)~~

Statement of Problem and Substantiation for Public Comment

This term isn't used in the NEC, so there is no reason to include it.

Related Item

• FR 7690

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 11 15:12:33 EDT 2021
Committee: NEC-P07

Public Comment No. 72-NFPA 70-2021 [Definition: Recreational Vehicle.]

Recreational Vehicle.

A vehicle or slide-in camper that is primarily designed as temporary living quarters for recreational, camping, or seasonal use; has its own motive power or is mounted on or towed by another vehicle; is regulated by the National Highway Traffic Safety Administration as a vehicle or vehicle equipment; does not require a special highway use permit for operation on the highways; and can ~~be easily transported~~ be transported and set up on a daily basis by an individual. [**1192:**3.3.53] (551) (CMP-7)

Informational Note: The basic entities are travel trailer, camping trailer, truck camper, and motor home as referenced in NFPA 1192-2021, *Standard on Recreational Vehicles*. See 3.3.52, *Recreational Vehicle*, and A.3.3.52 of NFPA 1192.

Statement of Problem and Substantiation for Public Comment

The word "easily" is far too subjective to be a part of this definition. A task that is relatively easy for one person may be difficult or challenging for another.

Related Item

• FR-7826

Submitter Information Verification

Submitter Full Name: Phil Simmons
Organization: Simmons Electrical Services
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 01 14:30:28 EDT 2021
Committee: NEC-P07

Public Comment No. 776-NFPA 70-2021 [Section No. 545.22]

545.22 Power Supply.

(A) Feeder.

A relocatable structure shall be supplied by a feeder. The feeder shall include four insulated color-coded conductors, one of which shall be an equipment grounding conductor. The equipment grounding conductor shall be permitted to be uninsulated if part of a listed cable assembly.

Informational Note: See Article 590 for temporary installation of feeder conductors.

(B) Number of Supplies.

Where two or more relocatable structures are structurally connected to form a single unit and there is a factory-installed panelboard in each relocatable structure, each panelboard shall be permitted to be supplied by a separate feeder.

(C) Identification.

The identification requirements in 225.37 shall not apply to relocatable structures structurally connected provided the following conditions are met:

(1) The relocatable structures are located on an industrial or commercial establishment where the conditions of maintenance and supervision ensure qualified individuals will service the installation.

(2) The individual panelboard enclosures or covers have been marked to indicate to location of their supply disconnecting means. The marking shall be visible without removing the cover and shall be of sufficient durability to withstand the environment involved.

(D) Grounding.

(1) Feeders.

The feeder(s) shall be grounded in accordance with Parts I, II, and III of Article 250.

(2) Two or More Relocatable Structures.

Where two or more relocatable structures are structurally connected to form a single unit, and a common grounding electrode conductor and tap arrangement as specified in 250.64(D)(1) is utilized, it shall be permitted to use the chassis bonding conductor specified in 545.26 as the tap conductor.

Additional Proposed Changes

File Name	Description	Approved
7_CN_320.pdf	7 CN320	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 320 appeared in the First Draft Report on First Revision No. 7705.

The Correlating Committee directs the panel to reconsider the Informational Note reference to Article 590 for compliance with Section 4.1.4 of the NEC Style Manual. The Correlating Committee also directs that the panel also review the phrase "four insulated color-conductors" since this may infer that feeders to relocatable structures may only be single phase and this may be unclear to the user of the NEC.

Related Item

• First Revision No. 7705

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:23:02 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 320-NFPA 70-2021 [Section No. 545.22]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 15:55:31 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to reconsider the Informational Note reference to Article 590 for compliance with Section 4.1.4 of the NEC Style Manual. The Correlating Committee also directs that the panel also review the phrase "four insulated color-conductors" since this may infer that feeders to relocatable structures may only be single phase and this may be unclear to the user of the NEC.

First Revision No. 7705-NFPA 70-2020 [Section No. 545.22]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 779-NFPA 70-2021 [Section No. 547.20]

547.20 Wiring Methods.

(A) Wiring Systems.

Conductor types shall be installed in accordance with the applicable requirements of this *Code* covering the type of wiring method used and shall be limited to the following methods:

(1) Type UF

(2) Type NMC

(3) Type SE cable-copper

(4) Jacketed Type MC cable

(5) Rigid polyvinyl chloride conduit

(6) Liquidtight flexible nonmetallic conduit (Type LFNC) with listed fittings

(7) Other cables or raceways suitable for the location

The wiring methods of Article 502, Part II, shall be permitted for areas described in 547.1.

Informational Note: See 300.7, 352.44, and 355.44 for installation of raceway systems exposed to widely different temperatures.

Additional Proposed Changes

File Name	Description	Approved
7_CN_321.pdf	7 CN321	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 321 appeared in the First Draft Report on First Revision No. 7746.

The Correlating Committee directs the panel to revise the first sentence in 547.20(A) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. All wiring methods must already be installed in accordance with applicable requirements unless modified in Article 547. NEC 547.20(A) creates a list to limit the wiring methods except item (7) which permits any suitable wiring method placing the entire section in conflict with the NEC 90.3 and Section 3.2.1 and 4.1.1 of the NEC Style Manual. The Correlating Committee further requests CMP-7 reconcile the committee statement prohibiting the RTRC wiring method while a reference to 355.44 addressing the application of RTRC remains in the informational note.

Related Item

• First Revision No. 7746

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:26:33 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 321-NFPA 70-2021 [Section No. 547.5(A)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 15:58:04 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to revise the first sentence in 547.20(A) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. All wiring methods must already be installed in accordance with applicable requirements unless modified in Article 547. NEC 547.20(A) creates a list to limit the wiring methods except item (7) which permits any suitable wiring method placing the entire section in conflict with the NEC 90.3 and Section 3.2.1 and 4.1.1 of the NEC Style Manual. The Correlating Committee further requests CMP-7 reconcile the committee statement prohibiting the RTRC wiring method while a reference to 355.44 addressing the application of RTRC remains in the informational note.

First Revision No. 7746-NFPA 70-2020 [Section No. 547.5(A)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 141-NFPA 70-2021 [Section No. 547.20(A)]

(A) Wiring Systems.

Conductor types shall be installed in accordance with the applicable requirements of this *Code* covering the type of wiring method used and shall be limited to the following methods:

(1) Type UF

(2) Type NMC

(3) Type SE cable-copper

(4) Jacketed Type MC cable

(5) Rigid polyvinyl chloride conduit

(6) Reinforced Thermosetting Resin Conduit.

(7) Liquidtight flexible nonmetallic conduit (Type LFNC) with listed fittings

(8) Other cables or raceways suitable for the location

The wiring methods of Article 502, Part II, shall be permitted for areas described in 547.1.

Informational Note: See 300.7, 352.44, and 355.44 for installation of raceway systems exposed to widely different temperatures.

Statement of Problem and Substantiation for Public Comment

The substantiation in PI-4607 that resulted in replacing the term “Rigid Nonmetallic Conduit” with rigid polyvinyl chloride conduit is not correct.

Prior to the introduction of Articles 353 and 355, the term Rigid Nonmetallic Conduit was a generic term that included HDPE, PVC and RTRC, or any other type of rigid conduit made from non-metallic materials.
Nothing in the definition of RNC or in the construction specifications found in Article 347 placed any requirement for RNC to be made from any specific nonmetallic material.
The Fine Print Note following 347-1, going as far back as the 1981 code included a number of materials that would be suitable for the construction of RNC. Those materials included “fiberglass epoxy”, high-density polyethylene and polyvinyl chloride, as well as others.
In the 1999 code, a new "Table 347-9(B) Expansion Characteristics of Fiberglass Reinforced Conduit (Rigid Nonmetallic Conduit)" was added to the code.

It is clear to that prior to Article 347 being split into the 3 different types of RNC, that any reference to RNC in other code articles included all of types of RNC and there was no attempt to limit the term RNC to PVC.

While HDPE would may not be suitable for the application in this section, there is no reason to prohibit the use of RTRC raceways for this application.

Related Item

• PI-4607 • FR-7746 • PC-140 • PC-142 • PC-149

Submitter Information Verification

Submitter Full Name: Don Ganiere
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 06 17:22:18 EDT 2021
Committee: NEC-P07

Public Comment No. 1719-NFPA 70-2021 [Section No. 547.20(A)]

(A) Wiring Systems.

Conductor types shall be installed in accordance with the applicable requirements of this *Code* covering the type of wiring method used and shall be limited to the following methods:

(1) Type UF

(2) Type NMC

(3) Type SE cable-copper

(4) Jacketed Type MC cable

(5) Rigid polyvinyl chloride conduit

(6) Liquidtight flexible nonmetallic conduit (Type LFNC) with listed fittings

(7) Other cables or raceways ~~suitable~~ identified for the location

The wiring methods of Article 502, Part II, shall be permitted for areas described in 547.1.

Informational Note: See 300.7, 352.44, and 355.44 for installation of raceway systems exposed to widely different temperatures.

Statement of Problem and Substantiation for Public Comment

All of the public inputs accepted by CMP-7 related to the use of the term “Polyvinyl Chloride” as a recognized type of wiring method is consistent with the way that other types or raceways and conduits have been added in other NEC Articles for years. However, by adding words, “or other cables or raceways suitable for the location” is too vague of a term. What does “suitable” mean? The term added should have been, “or other cables or raceways identified for the location” as “identified” is a defined word in Article 100. Adding the term, “or other cables or raceways identified for the location” would allowed the user of the Code the use of other non-metallic raceways identified for the environment or location.

Related Item

• FR 7746 • PI 4607

Submitter Information Verification

Submitter Full Name: L. Keith Lofland
Organization: IAEI
Affiliation: None
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 14:15:22 EDT 2021
Committee: NEC-P07

Public Comment No. 1267-NFPA 70-2021 [Section No. 547.28]

547.28 Ground-Fault Circuit-Interrupter Protection.

Ground-fault circuit-interrupter (GFCI) protection shall be provided as required in 210.8(B)for areas of agricultural buildings not included in the scope of this article. GFCI protection shall not be required for other than 125-volt, 15- and 20-ampere receptacles installed within the following areas:

(1) Areas ~~having~~ requiring an equipotential plane

(2) Outdoors

(3) Damp or wet locations

(4) Dirt confinement areas for livestock

Statement of Problem and Substantiation for Public Comment

This input is being submitted on behalf of the Minnesota Department of Labor and Industry. The Department's 15 office/field staff, and 70 plus contract electrical inspectors complete over 150,000 electrical inspections annually.
The term "having" basically states that the EP was physically installed. In some cases, older existing ag installations may have areas of the barn or ag structure that does not contain an EP. This subtle change in this language would allow for the installer to use the same requirements whether of not the EP was physically installed; however, would still not change the intent to include "new" installations.

Related Item

• Global FR 7771

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 11 14:41:27 EDT 2021
Committee: NEC-P07

Public Comment No. 1420-NFPA 70-2021 [Section No. 547.28]

547.28 Ground-Fault Circuit-Interrupter Protection.

~~Ground-fault circuit-interrupter (~~ GFCI ~~)~~ protection shall ~~be provided as required in~~ ~~210.8(B)~~ ~~for areas of agricultural buildings~~ not ~~included in the scope of this article. GFCI protection shall not~~ be required for other than 125-volt, 15- and 20-ampere receptacles installed within the following areas:

(1) Areas having an equipotential plane

(2) Outdoors

(3) Damp or wet locations

(4) Dirt confinement areas for livestock

Statement of Problem and Substantiation for Public Comment

How does this article have requirements for installations that do not fall under the scope of this article??? Perhaps changing the scope of 547 to "agricultural buildings...and everything else" would be a solution?

Related Item

• FR 7771

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 12 16:37:37 EDT 2021
Committee: NEC-P07

Public Comment No. 780-NFPA 70-2021 [Section No. 547.41(B)]

(B) Service Disconnecting Means and Overcurrent Protection at the Building(s) or Structure(s).

Where the service disconnecting means and overcurrent protection are located at the building(s) or structure(s), the requirements of 547.41(B)(1) through (B)(3) shall apply.

(1) Conductor Sizing.

The supply conductors shall be sized in accordance with Part V of Article 220.

(2) Conductor Installation.

The supply conductors shall be installed in accordance with Part II of Article 225.

(3) Grounding and Bonding.

For each building or structure, grounding and bonding of the supply conductors shall be in accordance with 250.32, and the following conditions shall be met:

(1) The equipment grounding conductor is not smaller than the largest supply conductor if of the same material or is adjusted in size in accordance with the equivalent size columns of Table 250.122 if of different materials.

(2) The equipment grounding conductor is connected to the grounded circuit conductor and the site-isolating device enclosure at the distribution point.

Additional Proposed Changes

File Name	Description	Approved
7_CN_322.pdf	7 CN322	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 322 appeared in the First Draft Report on First Revision No. 7750.

The Correlating Committee directs the panel to review Section 547.41(8)(2) for redundancy since Article 225 already applies. NEC 90.3 indicates Chapters 1-4 apply generally and requirements in Chapter 5 supplement or modify the general requirements.

Related Item

• First Revision No. 7750

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:29:10 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 322-NFPA 70-2021 [Section No. 547.9(B)(2)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:00:48 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to review Section 547.41(B)(2) for redundancy since Article 225 already applies. NEC 90.3 indicates Chapters 1-4 apply generally and requirements in Chapter 5 supplement or modify the general requirements.

First Revision No. 7750-NFPA 70-2020 [Section No. 547.9(B)(2)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 142-NFPA 70-2021 [Section No. 550.10(I)]

(I) Mast Weatherhead or Raceway.

Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of either of the following:

(1) One mast weatherhead installation, installed in accordance with Parts I, II, III, IV, V, VI, VII, and VIII of Article 230, containing four continuous, insulated, color-coded feeder conductors, one of which shall be an equipment grounding conductor

(2) A rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit, or other raceways suitable for the location, from the disconnecting means in the mobile home to the underside of the mobile home, with provisions for the attachment to a suitable junction box or fitting to the raceway on the underside of the mobile home [with or without conductors as in 550.10(I)(1)]. The manufacturer shall provide written installation instructions stating the proper feeder conductor sizes for the raceway and the size of the junction box to be used.

Statement of Problem and Substantiation for Public Comment

The substantiation in PI-4609 that resulted in replacing the term “Rigid Nonmetallic Conduit” with rigid polyvinyl chloride conduit is not correct.

Prior to the introduction of Articles 353 and 355, the term Rigid Nonmetallic Conduit was a generic term that included HDPE, PVC and RTRC, or any other type of rigid conduit made from non-metallic materials.
Nothing in the definition of RNC or in the construction specifications found in Article 347 placed any requirement for RNC to be made from any specific nonmetallic material.
The Fine Print Note following 347-1, going as far back as the 1981 code included a number of materials that would be suitable for the construction of RNC. Those materials included “fiberglass epoxy”, high-density polyethylene and polyvinyl chloride, as well as others.
In the 1999 code, a new "Table 347-9(B) Expansion Characteristics of Fiberglass Reinforced Conduit (Rigid Nonmetallic Conduit)" was added to the code.

It is clear to that prior to Article 347 being split into the 3 different types of RNC, that any reference to RNC in other code articles included all of types of RNC and there was no attempt to limit the term RNC to PVC.

While HDPE would would not be suitable for the application in this section, there is no reason to prohibit the use of RTRC raceways for this application.

Related Item

• FR-7763 • PI-4609 • PC-140 • PC-141 • PC-149

Submitter Information Verification

Submitter Full Name: Don Ganiere
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 06 17:37:03 EDT 2021
Committee: NEC-P07

Public Comment No. 1721-NFPA 70-2021 [Section No. 550.10(I)]

(I) Mast Weatherhead or Raceway.

Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of either of the following:

(1) One mast weatherhead installation, installed in accordance with Parts I, II, III, IV, V, VI, VII, and VIII of Article 230, containing four continuous, insulated, color-coded feeder conductors, one of which shall be an equipment grounding conductor

(2) A rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, or other raceways ~~suitable~~ identified for the location, from the disconnecting means in the mobile home to the underside of the mobile home, with provisions for the attachment to a suitable junction box or fitting to the raceway on the underside of the mobile home [with or without conductors as in 550.10(I)(1)]. The manufacturer shall provide written installation instructions stating the proper feeder conductor sizes for the raceway and the size of the junction box to be used.

Statement of Problem and Substantiation for Public Comment

All of the public inputs accepted by CMP-7 related to the use of the term “Polyvinyl Chloride” as a recognized type of wiring method is consistent with the way that other types or raceways and conduits have been added in other NEC Articles for years. However, by adding words, “or other raceways suitable for the location” is too vague of a term. What does “suitable” mean? The term added should have been, “or other raceways identified for the location” as “identified” is a defined word in Article 100. Adding the term, “or other raceways identified for the location” would allowed the user of the Code the use of other non-metallic raceways identified for the environment or location.

Related Item

• FR 7763 • PI 4609

Submitter Information Verification

Submitter Full Name: L. Keith Lofland
Organization: IAEI
Affiliation: None
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 14:19:40 EDT 2021
Committee: NEC-P07

Public Comment No. 782-NFPA 70-2021 [Section No. 550.10(I)]

(I) Mast Weatherhead or Raceway.

Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of either of the following:

(1) One mast weatherhead installation, installed in accordance with Parts I, II, III, IV, V, VI, VII, and VIII of Article 230, containing four continuous, insulated, color-coded feeder conductors, one of which shall be an equipment grounding conductor

(2) A rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, or other raceways suitable for the location, from the disconnecting means in the mobile home to the underside of the mobile home, with provisions for the attachment to a suitable junction box or fitting to the raceway on the underside of the mobile home [with or without conductors as in 550.10(I)(1)]. The manufacturer shall provide written installation instructions stating the proper feeder conductor sizes for the raceway and the size of the junction box to be used.

Additional Proposed Changes

File Name	Description	Approved
7_CN_323.pdf	7 CN323	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 323 appeared in the First Draft Report on First Revision No. 7763.

The Correlating Committee directs the panel to revise the language references in 550.10(1) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The action to reference all Parts of Article 230 to comply with the style manual further substantiates the redundant and unnecessary reference to Article 230.

Related Item

• First Revision No. 7763

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:32:50 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 323-NFPA 70-2021 [Section No. 550.10(I)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:01:52 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to revise the language references in 550.10(I) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The action to reference all Parts of Article 230 to comply with the style manual further substantiates the redundant and unnecessary reference to Article 230.

First Revision No. 7763-NFPA 70-2020 [Section No. 550.10(I)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1421-NFPA 70-2021 [Section No. 550.13(B)]

(B) Ground-Fault Circuit Interrupters (GFCI).

Ground-fault circuit-interrupter protection shall be provided as required in 210.8(A). GFCI protection shall not be required for other than 125-volt, 15- and 20-ampere receptacles installed within a mobile or manufactured home in the following areas:

(1) Compartments accessible from outside the unit

(2) Bathrooms, including receptacles in luminaires

(3) Kitchens, where receptacles are installed to serve countertop surfaces

(4) Sinks, where receptacles are installed within 1.8 m (6 ft) from the top inside edge of the sink

(5) Dishwashers

~~Informational Note: See 422.5 for information on protection of dishwashers.~~

Statement of Problem and Substantiation for Public Comment

This section modifies the requirements of 422.5. Why would I tell the code user to read something that does not apply?

Related Item

• FR 7771

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 12 16:42:21 EDT 2021
Committee: NEC-P07

Public Comment No. 783-NFPA 70-2021 [Section No. 550.15]

550.15 Wiring Methods and Materials.

Except as specifically limited in this section, the wiring methods and materials included in this *Code* shall be used in mobile homes. Where either aluminum conductors or copper-clad aluminum conductors are installed, the conductors shall be used with equipment listed for the conductor materials in accordance with 110.14.

(A) Nonmetallic Boxes.

Nonmetallic boxes shall be permitted only with nonmetallic cable or nonmetallic raceways.

(B) Nonmetallic Cable Protection.

Nonmetallic cable located 380 mm (15 in.) or less above the floor, if exposed, shall be protected from physical damage by covering boards, guard strips, or raceways. Cable likely to be damaged by stowage shall be so protected in all cases.

(C) Metal-Covered and Nonmetallic Cable Protection.

Metal-covered and nonmetallic cables shall be permitted to pass through the centers of the wide side of 2 by 4 studs. However, they shall be protected where they pass through 2 by 2 studs or at other studs or frames where the cable or armor would be less than 32 mm (1¼ in.) from the inside or outside surface of the studs where the wall covering materials are in contact with the studs. Steel plates on each side of the cable, or a tube, with not less than 1.35 mm (0.053 in.) wall thickness shall be required to protect the cable. These plates or tubes shall be securely held in place.

(D) Metal Faceplates.

Where metal faceplates are used, the installation shall comply with 404.9(B) and 406.6(B).

(E) Installation Requirements.

Where a range, clothes dryer, or other appliance is connected by metal-covered cable or flexible metal conduit, a length of not less than 900 mm (3 ft) of unsupported cable or conduit shall be provided to service the appliance. The cable or flexible metal conduit shall be secured to the wall. Type NM or Type SE cable shall not be used to connect a range or dryer. This shall not prohibit the use of Type NM or Type SE cable between the branch-circuit overcurrent protective device and a junction box or range or dryer receptacle.

(F) Raceways.

Where rigid metal conduit or intermediate metal conduit is terminated at an enclosure with a locknut and bushing connection, two locknuts shall be provided, one inside and one outside of the enclosure. Rigid nonmetallic conduit, electrical nonmetallic tubing, or surface raceway shall be permitted. All cut ends of conduit and tubing shall be reamed or otherwise finished to remove rough edges.

(G) Switches.

Switches shall be rated as follows:

(1) For lighting circuits, switches shall be rated not less than 10 amperes, 120 to 125 volts, and in no case less than the connected load.

(2) Switches for motor or other loads shall comply with 404.14.

(H) Under-Chassis Wiring (Exposed to Weather).

(1)

Where outdoor or under-chassis line-voltage (120 volts, nominal, or higher) wiring is exposed, it shall be protected by a conduit or raceway identified for use in wet locations. The conductors shall be listed for use in wet locations.

(2)

Where wiring is exposed to physical damage, it shall be protected by a raceway, conduit, or other means.

(I) Boxes, Fittings, and Cabinets.

Boxes, fittings, and cabinets shall be securely fastened in place and shall be supported from a structural member of the home, either directly or by using a substantial brace.

Exception: Snap-in-type boxes. Boxes provided with special wall or ceiling brackets and wiring devices with integral enclosures that securely fasten to walls or ceilings and are identified for the use shall be permitted without support from a structural member or brace. The testing and approval shall include the wall and ceiling construction systems for which the boxes and devices are intended to be used.

(J) Appliance Terminal Connections.

Appliances having branch-circuit terminal connections that operate at temperatures higher than 60°C (140°F) shall have circuit conductors as described in the following:

(1) Branch-circuit conductors having an insulation suitable for the temperature encountered shall be permitted to be run directly to the appliance.

(2) Conductors having an insulation suitable for the temperature encountered shall be run from the appliance terminal connection to a readily accessible outlet box placed at least 300 mm (1 ft) from the appliance. These conductors shall be in a suitable raceway or Type AC or MC cable of at least 450 mm (18 in.) but not more than 1.8 m (6 ft) in length.

(K) Component Interconnections.

Fittings and connectors that are intended to be concealed at the time of assembly shall be listed and identified for the interconnection of building components. Such fittings and connectors shall be equal to the wiring method employed in insulation, temperature rise, and fault-current withstanding and shall be capable of enduring the vibration and shock occurring in mobile home transportation.

Informational Note: See 550.19 for interconnection of multiple section units.

Additional Proposed Changes

File Name	Description	Approved
7_CN_324.pdf	7 CN324	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 324 appeared in the First Draft Report on First Revision No. 7786.

The Correlating Committee directs the panel to revise the language references in 550.15 for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The references to 110.14 in 550.15, the references to NEC 404.9 and NEC 406.6 in 550.15(D) are redundant and the last sentence repeats requirements in Article 250.

Related Item

• First Revision No. 7786

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:35:34 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 324-NFPA 70-2021 [Section No. 550.15 [Excluding any Sub-Sections]]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:03:25 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to revise the language references in 550.15 for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The references to 110.14 in 550.15, the references to NEC 404.9 and NEC 406.6 in 550.15(D) are redundant and the last sentence repeats requirements in Article 250.

First Revision No. 7786-NFPA 70-2020 [Section No. 550.15 [Excluding any Sub-Sections]]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1637-NFPA 70-2021 [Section No. 550.15 [Excluding any Sub-Sections]]

Except as specifically limited in this section, the wiring methods and materials included in this *Code* shall be used in mobile homes. ~~Where either aluminum conductors or copper-clad aluminum conductors are installed, the conductors shall be used with equipment listed for the conductor materials in accordance with 110.14 .~~

Statement of Problem and Substantiation for Public Comment

Section 110.14 does not require listing for the terminations that this sentence is discussing. This language is also a violation of 4.1.2 of the style manual.

Related Item

• PI 541

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 18:48:33 EDT 2021
Committee: NEC-P07

Public Comment No. 786-NFPA 70-2021 [Section No. 550.16(A)]

(A) Grounded Conductor.

(1) Insulated.

The grounded circuit conductor shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts. The grounded circuit conductor terminals in the panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps, or buses in the panelboard or in appliances shall be removed and discarded. Where the panelboard is the service equipment as permitted by 550.32(B), the neutral conductors and the equipment grounding bus shall be connected.

(2) Connections of Ranges and Clothes Dryers.

Connections of ranges and clothes dryers with 120/240-volt, 3-wire ratings shall be made with 4-conductor cord and 3-pole, 4-wire, grounding-type plugs or by Type AC cable, Type MC cable, or conductors enclosed in flexible metal conduit.

Additional Proposed Changes

File Name	Description	Approved
7_CN_325.pdf	7 CN325	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 325 appeared in the First Draft Report on First Revision No. 7792.

The Correlating Committee directs the panel to revise the language references in 550.16(A)(1) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The reference to 552.32(8) is redundant and the last sentence repeats requirements in Article 250.

Related Item

• First Revision No. 7792

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:40:17 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 325-NFPA 70-2021 [Section No. 550.16(A)(1)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:04:32 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to revise the language references in 550.16(A)(1) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The reference to 552.32(B) is redundant and the last sentence repeats requirements in Article 250.

First Revision No. 7792-NFPA 70-2020 [Section No. 550.16(A)(1)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 791-NFPA 70-2021 [Section No. 550.16(C)]

(C) Bonding of Non-Current-Carrying Metal Parts.

(1) Exposed Non-Current-Carrying Metal Parts.

All exposed non-current-carrying metal parts that are likely to become energized shall be effectively bonded to the grounding terminal or enclosure of the panelboard. A bonding conductor shall be connected between the panelboard and an accessible terminal on the chassis. Chassis of multiple mobile home sections shall be bonded together with a solid copper, 8 AWG minimum, insulated or bare, bonding conductor with terminations in accordance with 250.8 and 250.12.

(2) Grounding Terminals.

Grounding terminals shall be of the solderless type and listed as pressure-terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare, and shall be 8 AWG copper minimum, or equivalent. The bonding conductor shall be routed so as not to be exposed to physical damage.

(3) Metallic Piping and Ducts.

Metallic gas, water, and waste pipes and metallic air-circulating ducts shall be considered bonded if they are connected to the terminal on the chassis [see 550.16(C)(1)] by clamps, solderless connectors, or by suitable grounding-type straps.

(4) Metallic Roof and Exterior Coverings.

Any metallic roof and exterior covering shall be considered bonded if the following conditions are met:

(1) The metal panels overlap one another and are securely attached to the wood or metal frame parts by metallic fasteners.

(2) The lower panel of the metallic exterior covering is secured by metallic fasteners at a cross member of the chassis by two metal straps per mobile home unit or section at opposite ends.

The bonding strap material shall be a minimum of 100 mm (4 in.) in width of material equivalent to the skin or a material of equal or better electrical conductivity. The straps shall be fastened with paint-penetrating fittings such as screws and starwashers or equivalent.

Additional Proposed Changes

File Name	Description	Approved
7_CN_326.pdf	7 CN326	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 326 appeared in the First Draft Report on First Revision No. 7794.

The Correlating Committee directs the Panel to revise the language references in 550.16(C)(1) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The references to 250.8 and 250.12 are redundant .

Related Item

• First Revision No. 7794

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:46:23 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 326-NFPA 70-2021 [Section No. 550.16(C)(1)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:05:43 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to revise the language references in 550.16(C)(1) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The references to 250.8 and 250.12 are redundant .

First Revision No. 7794-NFPA 70-2020 [Section No. 550.16(C)(1)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 419-NFPA 70-2021 [Section No. 550.16(C)(2)]

(2) Grounding Terminals.

Grounding terminals shall be of the solderless type and listed as pressure-terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare, and shall be 8 AWG copper- ~~minimum~~ -clad steel or copper minimum , or equivalent. The minium size of 6 AWG copper-clad aluminum shall be permitted. The bonding conductor shall be routed so as not to be exposed to physical damage.

Additional Proposed Changes

File Name	Description	Approved
CCS_Corrosion_paper_Rev2.pdf	50 Year Corrosion Study Copper-Clad Steel Grounding	
FR7714.CCA.604.100_A_2_.doc	CCA is Similar Metal to Copper. NEC.	
Section_770.100_A_2_Committee_Statement_CMP16.doc	CMP16 Committee Statement. CCS Suitable For Use for Grounding and Bonding	
ATS_ShearTestRpt.pdf	Third Party Mechanical Testing: CCS 40% Wire vs Single-metal Copper Wire	

Statement of Problem and Substantiation for Public Comment

Public Input 2514 requested that Copper-Clad Aluminum be included as a bonding conductor within section 550.16(C)(2). Copper-Clad Aluminum is recognized in the main body of Code as a bonding conductor, see Table 250.102(C)(1). There is no technical reason that CCA should not be permitted in 550.16(C)(2). CCA is a similar metal to Copper for the application of electrical connections per section 110.14. CCA correlation during First Revision was widespread, as evidenced by FR 7714 (see attached). Committee statement of CMP7: "Based on 2020 revisions to the NEC, Section 110.14, copper-clad aluminum is no longer considered a dissimilar metal to copper and as such is permitted in 604.100(A)(1)." Finally, CCA has little scrap value on the street, so it is not a target of theft as is single-metal copper, a material of increasing value to thieves. Please reconsider adding CCA to this section to be in sync with the main body of Code.

Regarding the use of Copper-Clad Steel wire as a bonding jumper, CCS 40% is a proven low impendence material used for bonding by utilities for a century. CCS 40% is often employed over single-metal copper bonding conductors because it is noticeably more difficult to cut, sever and remove. Thieves quickly realize that it is not copper. It has little scrap value on the street, so there is little incentive to steal it. The theft of single-metal copper grounding and bonding conductors is the single greatest threat today to the electrical safety of the public. For a bonding or grounding conductor to disappear due to theft puts the Public as risk of shock or electrocution. CCS 40% is both corrosion resistant and strong. CCS 40% wire has no spring-back force due to its soft annealed state. It is flexible (especially in the stranded form) but hard. According to the US Department of Energy Materials Science Division, mild steel (the grade used for CCS 40%) has a hardness value 3.75X times greater than single-metal copper, enough so that thieves will have difficulty cutting it, recognize it, and move on. CCS 40% is also 11% lighter than single-metal copper size per size, lighter weight being of value for mobile homes. CCS 40% is fully standardized as a bonding conductor by ASTM B910, and is referenced by the National Electrical Safety Code for bonding and grounding applications. As late as January of 2021, Code Make Panel 16 reconfirmed CCS as a suitable conductor material for grounding and bonding. Note attached Committee Statement from PI 2491. Finally, a listing is not required by 550.16(C)(2) for any conductor material, thus should not be cited as a reason not to permit CCS 40% as a bonding material.

Related Item

- PI 2514

Submitter Information Verification

Submitter Full Name: Peter Graser
Organization: Copperweld
Affiliation: American Bimetallic Association
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 27 11:25:41 EDT 2021
Committee: NEC-P07

CORROSION ON BURIED COPPER CLAD STEEL

Cece Syarif

Global Application Engineer

&

Anthony Hale

Manager, Utility Products, North America

The results and conclusions obtained from studies done by Copperweld are only applicable to Copper Clad Steel manufactured by Copperweld. Due to proprietary process used to produce the wire, the findings cannot be superimposed on any other copper-clad steel conductor.

COPPERWELD

254 Cotton Mill Rd, Fayetteville, TN 37334. Tel. (931) 433 – 7177

July 26, 2011

This paper compiles several studies and analysis regarding the corrosion performance of buried Copperweld® Copper-Clad-Steel (CCS) conductors. These range from the early 1900's with the invention of Copperweld® through the present day with studies performed by independent parties as well as Copperweld Company in-house testing. The purpose is to present the available information so that prospective users of Copperweld® CCS wire and strand can evaluate the corrosion resistance and expected performance within their specific application and area. Copperweld uses oxygen free copper in the manufacture of Copperweld® wire and strand. The copper surface of CCS is expected to oxidize and turn color ranging from green (patination) to brown and black the same as any solid copper wire or strand when exposed to environmental stimuli. Corrosion on exposed steel at the cut tip or end of the wire is also expected. The question to be answered is if the corrosion on either material or the interface between the copper and steel (galvanic reaction) will result in degradation of the wire as to make it unsuitable for use as a grounding conductor.

The oldest known underground corrosion study of bimetallic material was performed in the early 1900s[1]. This study focused on the corrosion behavior of Copperweld® CCS underground rod as well as other materials such as Copper and galvanized steel ground rod. The National Bureau of Standards (NBS) conducted an extensive underground corrosion study that involves 36,500 specimens which include 333 varieties of ferrous, nonferrous, and protective coating materials buried in 128 test locations throughout U.S in 1910 - 1955.

The study summarizes the service life of a ground rod as following:

10 mils copper coating – acceptable for service life up to 40 years

13 mils copper coating – acceptable for service life up to 50 years

Similarly, the Naval Civil Engineering Laboratory in collaboration with the National Association of Corrosion Engineers conducted a 7-year program of testing metal rods for electrical grounding to determine the galvanic corrosion effect. The three metals tested were stainless clad steel, copper-bonded steel (CCS), and galvanized steel. The result on the ⅝" CCS ground rod was as expected. The copper surface of the CCS was

virtually free of corrosion and the steel core has corroded at the tip approximately 2 inches down the length of the rod.

Copperweld Corporation is the inventor and sole manufacturer of Copperweld® Copper-bonded ground rods and Copperweld® wire and strand since 1915. The corrosion behavior of a Copperweld® ground rod is similar to the corrosion on Copperweld® wire and strand conductor. Both materials consist of copper permanently bonded to a steel core. All Copperweld® 40% CCS has a copper thickness of 10% of the overall diameter. For example, Copperweld® 4THOUGHT™ has a configuration of 19 strands of 0.1055 inch wires. It means that each strand has a copper thickness of 10.55 mils. Based on the NBS study, 4THOUGHT™ will have at least a minimum service life of 40 years.

Copperweld has also conducted a 5-year study of buried bare 21% conductivity (copper thickness is 3% of the diameter) Copperweld® CCS in 10 different soil conditions in association with Southwest Research Institute[2]. The study reported 100% surface oxidation and various degrees of deterioration of the steel core as expected after 5 years. The exposed steel on the tip of the wire rusted and formed "scab", as shown in Figure 1. The rust appeared to "seal-off" the un-oxidized material from the corrosive medium. The maximum depth of corrosion was 70% of the wire diameter.

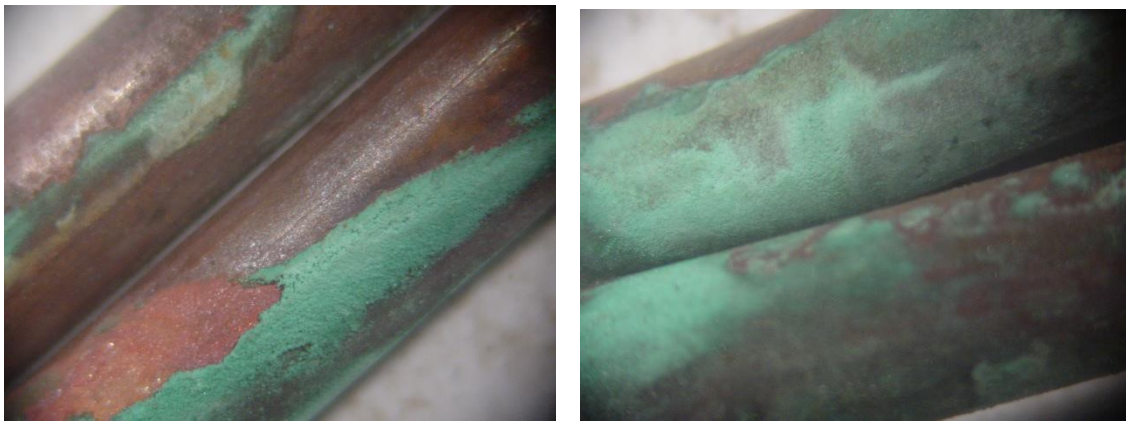
Figure 1: Example of Underground Corrosion of Copper Clad Steel

Although the copper surface oxidation was heavy, the samples showed no signs of pits or holes in the copper cladding. The copper thickness of a severely oxidized 5-year sample showed no discernable difference when compared to an un-oxidized control sample that was not subjected to the corrosive environment. The mechanical and resistance testing

254 Cotton Mill Rd, Fayetteville, TN 37334. Tel. (931) 433 – 7177

resulted in negligible differences between 5-year samples and the control samples. Thus, the oxidation had no discernable impact on the strength or electrical performance of the wire.

An accelerated corrosion study based on ASTM B117 was conducted on bare CCS and solid Copper wires to evaluate copper surface corrosion. The wires were exposed to salt fog spray for 504 hours. As a result, corrosion on the CCS copper surface showed no significant difference as compared to the corrosion of copper wire.



(a) Copper Clad Steel (b) Copper

Figure 2: Patination of Copper Surface after 504 hours exposure to Salt Fog Spray

In February 2011, three separate sample strands of Copper Clad Steel were un-earthed and cut out from a substation built in Louisville, KY. The conductors were 40% conductivity, Low Carbon Steel, Dead Soft Annealed, 7 No. 5 (231,613 circular mil) and were installed in 1962.

Table 1: Physical properties of the three strands of Copperweld® conductor that had been buried underground for 48 years in a Kentucky substation

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			Strand 1	Strand 2	Strand 3
Conductor Type			40% Low Carbon Annealed		
Conductor Size			7 No. 5		
Cross Section Area		in^2	0.1819	0.1819	0.1819
Diameter of Single end		*inch*	0.1819	0.1819	0.1819
Diameter of Conductor		*inch*	0.5457	0.5457	0.5457
Copper Thickness	Min	*inch*	0.0142	0.0114	0.0134
	Max	*inch*	0.0213	0.0209	0.01975
% Concentricity			83.30%	77.30%	83.90%
Depth of corrosion	Min	*inch*	0.004	0.028	0.111
	Max	*inch*	0.781	0.859	0.484

The 1962 conductors were manufactured by Copperweld with a nominal copper thickness of 10% of its diameter. Figure 3 shows the copper thickness ranges from 11.4 – 21.3 mils and the concentricity of the conductor averaged at 81.5%. Current manufacturing improvements yield concentricity of copper thickness above 85%.

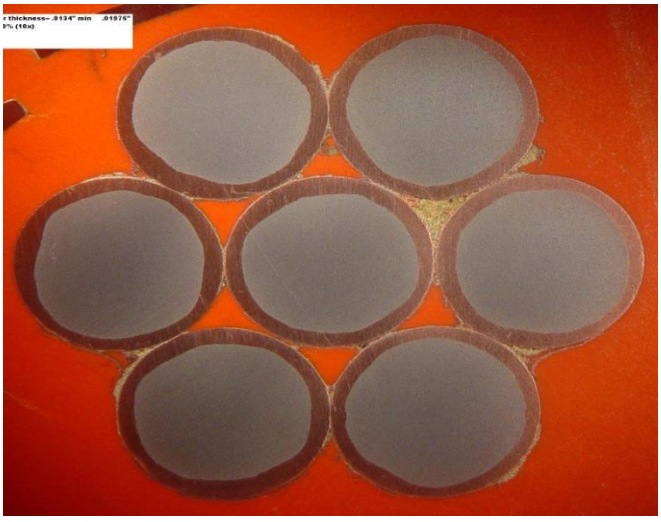

Figure 3: Copperweld® 40% LC DSA 7 No. 5 manufactured in 1962

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Figure 4a shows no visible corrosion observed other than oxidation and patination on the copper surface. At the ends of the wires, the corrosion occurred in the form of steel rust. The maximum depth of the corrosion is 0.859 inch with an average of 0.382 inch, as shown in Figure 4b.

Figure 4a: There is no visible corrosion between the copper and steel on all wires obtained from the substation in Kentucky.

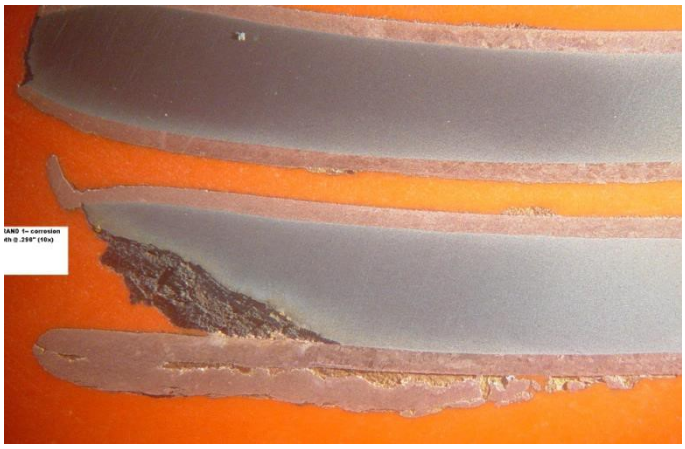

Figure 4b: Corrosion occurred at the ends of the wires. Maximum penetration depth is 0.859 inch.

From all the corrosion studies above, there have not been reported or observed any galvanic corrosion at the interface of copper and steel. The process of cladding for

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Copperweld® ensures a metallurgical bond between the two metals. That metallurgical bond prevents any moisture from penetrating between the two metals precluding the corrosion process. Any propagation of corrosion on an area of exposed steel averages two times the diameter of the wire then stops. The corrosion rate of the copper surface is equivalent to that observed on standard solid copper wire and strand. Based on the results of these studies, it can be summarized that CCS can be expected to have a 50 plus year service life as buried grounding conductors.

REFERENCES:

1. Rempe, Chris. 7 July 2003. "A Technical Report on the Service Life of Ground Rod Electrodes".
2. Fox, Dustin, Belado, Chris, and Brossia, Sean. 23 September 2009. "The Effect of Corrosion on Tracer Wire with a Copper Clad Steel Center Conductor".

First Revision No. 7714-NFPA 70-2020 [Section No. 604.100(A)(2)]

Detail FR-7745

(2) Conduits.

Conduit shall be listed flexible metal conduit, ~~or~~ listed liquidtight flexible conduit, or electrical metallic tubing (EMT) containing nominal 600-volt, 8 AWG to 12 AWG insulated copper-clad aluminum or copper conductors with a bare or insulated copper-clad aluminum or copper equipment grounding conductor equivalent in size to the ungrounded conductor.

Exception No. 1 to (1) and (2): A luminaire tap, no longer than 1.8 m (6 ft) and intended for connection to a single luminaire, shall be permitted to contain conductors smaller than 12 AWG but not smaller than 18 AWG.

Exception No. 2 to (1) and (2): Listed manufactured wiring assemblies containing conductors smaller than 12 AWG shall be permitted for remote-control, signaling, or communications circuits.

Exception No. 3 to (2): Listed manufactured wiring systems containing unlisted flexible metal conduit of noncircular cross section or trade sizes smaller than permitted by 348.20(A), or both, shall be permitted where the wiring systems are supplied with fittings and conductors at the time of manufacture.

Submitter Information Verification

Committee: NEC-P07

Submittal Date: Mon Dec 07 16:50:36 EST 2020

Committee Statement

Committee Statement: Based on 2020 revisions to the NEC, Section 110.14, copper-clad aluminum is no longer considered a dissimilar metal to copper and as such is permitted in 604.100(A)(2).

Response Message: FR-7714-NFPA 70-2020

Public Input No. 2485-NFPA 70-2020 [Section No. 604.100(A)(2)]

Ballot Results

This item has passed ballot

x

18 Eligible Voters

0 Not Returned

17 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

X

Affirmative All

Arocha, Jorge L.

Elliott, Wade
Fick, Robert J.
Gilbert, Adam
Gray, Jacob
Hyer, Ryan
Lichtenstein, Thomas R.
Lofland, L. Keith
Loftis, Gary Dale
Mihalick, David M.
Mulvaney, Doug
Norton, Clifford
Paredes, Richard A.
Richardson, Curt
Rood, Stephen G.
Wheeler, Wesley L.
Zieman, Michael L.
X
Negative with Comment
Reis, Paul J.
Aluminum Association response is there was inadequate substantiation provided to support this change.

Public Input No. 2491-NFPA 70-2020 [Section No. 770.100(A)(2)]

(2) Material.

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

Additional Proposed Changes

File Name	Description	Approved
CCS_Corrosion_paper_Rev2.pdf	50 Year Corrosion Study Copper Clad Steel Wire for Substation Grounding Matts	
TD002391.doc	UL 467 Short Circuit and UL 486A-B Mechanical Sequence Copper Clad Steel	
PL-03027_REP1.pdf	Fusing and Withstand Testing	
CEL_-_13_Grounding_Conductor_Current_Test_002_.pdf	Grade 40CCS Conductivity Test Report. Lewey and Rozer	

Statement of Problem and Substantiation for Public Input

Grounding Electrode Conductor Purpose: The purpose of the grounding electrode system, grounding electrode(s) and grounding electrode conductor(s) is to provide a connection to earth for the electrical system and equipment. The grounding electrode system functions to limit errant voltages caused by lightning, transients and high voltage line clashes. For grounded systems it stabilizes the voltage of the electrical system during normal operations and keeps the voltage to ground at predictable limits. A grounding electrode conductor must be both strong and conductive. It should be strong enough mechanically to withstand high current/frequency (A/Hz) lightning strikes as well as any damage from normal use. Where terminated in or near ground level, it must be corrosion resistant. Finally, a grounding electrode conductor must be able to be connected with standard industry-accepted connectors that are used within the grounding electrode system. Grounding Electrode Conductor Materials: The present materials permitted for grounding electrode conductors are copper, aluminum and copper-clad aluminum. The aluminum and copper-clad aluminum are limited in use by 250.64(A) where the bare conductor is in or near the ground or concrete at grade level. Grade 40 Copper-Clad Steel (40CCS), a copper bimetal, is another alternative designed for use as a grounding electrode conductor (GEC) and should be added to the NEC®. It is governed by ASTM B910/B910M-2007, the Standard Specification for Annealed Copper-Clad Steel Wire. The standard's scope states the following: This specification covers bare round copper-clad steel for the following applications: electrical, electronic, grounding, telecommunications, and other applications. Per the standard, the minimum tensile strength for all wire diameters must be higher than 40,000 PSI, which would elevate the strength of GEC materials currently provided in Article 250. The shear modulus of Grade 40CCS is 11,600 KSI. Because ASTM B910 requires 40CCS to be annealed (softened), the material is sufficiently pliable to allow for traditional installation practices for GEC's. Increased mechanical strength of a GEC elevates the protection of an electrical installation in two ways: 1) the GEC can better withstand fusing during ultra-high A/Hz lightning strikes (see connector and fusing discussions below); 2) the GEC is noticeably more difficult to cut without proper tools, which aids as a theft deterrent when thieves attempt to remove it. Additionally, Copper Clad Steel has no scrap value, which also disincentives theft. Terminations and Connectors: Grade 40CCS conductors have successfully passed UL 467 Short Circuit Testing for standard connectors available in the market. 40CCS conductors also successfully passed UL 486A and 486B for Mechanical

Sequence Testing. Attached to this Public Input, please reference Test Report TD002391, Burndy, UL 467 Short Circuit & UL 486A – 486B Mechanical Sequence Tests with Copperweld 40% Copper Clad Steel. These results offer clear evidence that 40CCS performs satisfactorily with grounding connector hardware standard for grounding systems. Corrosion Resistance: Corrosion can cause GEC connections to fail in the grounding system. As a copper bimetal, Grade 40CCS maintains the corrosion resistance characteristics required to keep grounding systems intact. Copper Clad Steel was invented in 1915 by the Copperweld Company in Rankin, PA, for use as both a grounding electrode and GEC. One of grade 40 CCS's traditional applications is as a buried grounding electrode for utility substations meeting IEEE Standard 80, IEEE Guide for Safety in AC Substation Grounding. For substantiation of the corrosion resistance of Grade 40CCS, please refer to the white paper attached to this Public Input: CCS_Corrosion_Paper_Rev2. Corrosion on Buried Copper Clad Steel, by Syarif and Hale. The paper describes the condition of grade 40CCS after 50 years of use as part of a ground grid under a substation in Kentucky. Resistance to Fusing at High Currents: The GEC must also have the integrity to hold up to high-current forces such as lightning. Fusing and withstand testing was conducted to judge the suitability of Grade 40CCS as a GEC. For reference, like-sized copper conductors were tested alongside CCS conductors. The results prove that grade 40CCS performs equal to or better than the same size copper conductor. Attached to this Public Input, please review test report PL-03027_REP1 "Copper and CCS Wire Withstand Current and Fusing Current Testing." Testing conducted at the Powertech Test Lab of Surrey, BC, Canada. Conductivity: Although not required to carry current continuously, the GEC must be conductive. The attached test report by Bill Lewey and Mike Rozer proves Grade 40CCS's conductivity. See CEL-13 Grounding Current Conductor Test. Current NEC® Applications: Copper Clad Steel as a GEC material is currently referenced in section 810.21(A) of the NEC®. . In addition to the substantiation information provided above for correlation purposes 40CCS should be included in applicate Articles, such as Article 250, and sections that specify grounding electrode conductor material. Public inputs have been submitted for this action in a number of sections. Listing: There are other grades of copper-clad steel available and this change is to be specific to Grade 40CCS conductor material. To ensure that the conductor material being installed is Grade 40CCS, the conductor material should be listed to the applicable ASTM standards. In addition to ensuring there is 40 percent copper cladding on the steel core, suitable tensile strength, and other factors the listing also ensures the critical aspect of the corrosion resistant properties of 40CCS, a copper bimetal, are provided through the metallurgical bond between the steel and the copper. A listing would guarantee the metallurgical bond, the hallmark of a true bimetal. The listing and suitable markings on tags or packaging also provides the installer and inspector the information needed to make and approve the installation.

Related Public Comments for This Document

Related Comment	Relationship
Public Input No. 2462-NFPA 70-2020 [Section No. 250.62]	CCS Grounding Conductors
Public Input No. 2472-NFPA 70-2020 [Section No. 250.102(C)(2)]	CCS Bonding Conductors
Public Input No. 2467-NFPA 70-2020 [Section No. 250.66 [Excluding any Sub-Sections]]	CCS Grounding Conductors

Submitter Information Verification

Submitter Full Name: Peter Graser

Organization: Copperweld

Affiliation: American Bimetallic Association

Street Address:

City:

State:

Zip:

Submittal Date: Sun Aug 23 15:22:11 EDT 2020

Committee: NEC-P16

Committee Statement

Resolution: The existing text states "or equivalent" which is inclusive of copper-clad steel. The addition of "copper-clad steel" provides no additional clarity.

Applied Technical Services

We Take A Closer Look
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TEST REPORT 359379

Contact: **Bill Lewey**
Customer: **Copperweld Bimetallics LLC**
254 Cotton Mill Road
Fayetteville, TN 37334

Date: 8-4-21
Purchase Order: 054689

Summary

Four (4) groups of copper rods were submitted for double shear testing in accordance with the customer provided instructions of using ASTM B769 as a guide. The copper material and the diameter of the #6 rod was a deviation from the requirements of the specification. Two specimens from each group were tested in a fixture like the one shown in Figure 1 of ASTM B769-11. Testing was also in accordance with ATS QA Manual Rev. 18 dated 10/16/20.

Sample Table

ATS#	P/N	Description	Pass/Fail
N/A	#6 Copper Clad Rod (Samples 1&2)	Rod	No requirements provided
N/A	#6 Solid Copper Rod (Samples 1&2)	Rod	No requirements provided
N/A	#4 Solid Copper Rod (Samples 1&2)	Rod	No requirements provided
N/A	#4 Copper clad Rod (Samples 1&2)	Rod	No requirements provided

Reviewed by_____ Dennis Johnson 2021.08.05 12:20:50 -04'00'
D. Johnson, Mechanical Testing

Reviewed by_____ Rodney Allen
DN: O=ATS, CN=Rodney Allen, E=rallen@atslab.com
Reason: I have reviewed this document
Location:
Date: 2021-08-05 12:29:52
W.R. Allen Mechanical Testing

ISO 9001

Table 1: Double Shear Testing

Sample	**Shear Strength** (psi)	**Ult. Load** (lbf)	**Diameter** (in)	**Area (double shear)** (in^2)
#6-1 Copper Clad	38,644	1,603	0.1625	0.0415
#6-2 Copper Clad	37,032	1,533	0.1624	0.0414
#6-1 Solid Copper	23,842	960	0.1601	0.0403
#6-2 Solid Copper	24,565	992	0.1604	0.0404
#4-1 Solid Copper	24,611	1,602	0.2036	0.0651
#4-2 Solid Copper	24,914	1,618	0.2034	0.0650
#4-1 Copper Clad	36,518	2,374	0.2035	0.0650
#4-2 Copper Clad	38,506	2,504	0.2035	0.0650

Public Comment No. 1535-NFPA 70-2021 [Section No. 550.32(A)]

(A) Mobile Home Service Equipment.

The mobile home service equipment shall not be mounted in or on the mobile home. The service equipment shall be rated not less than that required in accordance with 550.32(C), mounted in a readily accessible outdoor location, and ~~visible from~~ within sight from the mobile home it serves. The mobile home service disconnect shall be permitted to be used as the emergency disconnect in accordance with 230.85. Grounding at the disconnecting means shall be in accordance with 250.32.

Statement of Problem and Substantiation for Public Comment

This input is being submitted on behalf of the Minnesota Department of Labor and Industry. The Department's 15 office/field staff, and 70 plus contract electrical inspectors complete over 150,000 electrical inspections annually.
The language proposed in 230.85 (FR 7770) uses the term "within sight". The language in 550.32 should be consistent with the 230.85 requirement, so additional service disconnects would not be required as long as the emergency disconnect is installed with sight, and is considered the service disconnecting means. The current language would supplement or modify the general requirements which was not the believed intent of CMP-7.

Related Item

• FR 7832 • PI 2630

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 12:03:54 EDT 2021
Committee: NEC-P07

Public Comment No. 792-NFPA 70-2021 [Section No. 550.32(A)]

(A) Mobile Home Service Equipment.

The mobile home service equipment shall not be mounted in or on the mobile home. The service equipment shall be rated not less than that required in accordance with 550.32(C), mounted in a readily accessible outdoor location, and visible from the mobile home it serves. The mobile home service disconnect shall be permitted to be used as the emergency disconnect in accordance with 230.85. Grounding at the disconnecting means shall be in accordance with 250.32.

Additional Proposed Changes

File Name	Description	Approved
7_CN_327.pdf	7 CN327	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 327 appeared in the First Draft Report on First Revision No. 7832.

The Correlating Committee directs the Panel to revise the language referenced in 550.32(A) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The reference to 552.32(C) is redundant and the last two sentences of text repeat requirements from Articles 230 and 250.

Related Item

• First Revision No. 7832

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:48:13 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 327-NFPA 70-2021 [Section No. 550.32(A)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:06:54 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to revise the language referenced in 550.32(A) for compliance with NEC 90.3 and Section 4.1.1 of the NEC Style Manual. The reference to 552.32(C) is redundant and the last two sentences of text repeat requirements from Articles 230 and 250.

First Revision No. 7832-NFPA 70-2020 [Section No. 550.32(A)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 772-NFPA 70-2021 [Section No. 550.33(A)]

(A) Feeder Equipment.

The feeder equipment, including the disconnecting means, shall not be mounted in or on the mobile home. A manufactured home feeder disconnecting means shall be permitted to be installed in or on the manufactured home in accordance with the requirements of 550.32(B). The feeder equipment shall be rated not less than that required in 550.32(C), mounted in a readily accessible outdoor location, and visible from the mobile home or manufactured home it serves. Grounding of the disconnecting means shall be in accordance with 250.32.

Additional Proposed Changes

File Name	Description	Approved
7_CN_318_Detail.pdf	7 CN318	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No.318 appeared in the First Draft Report on First Revision No. 7874.

The Correlating Committee directs the panel to review FR-7874 since the term "feeder equipment" is not defined within the NEC and may create confusion to the user of the code. The Correlating Committee directs that the last sentence of 550.33(A) be reviewed to determine if it is necessary since it does not supplement or modify the Chapter 2 general requirement for grounding.

Related Item

• First Revision No. 7874

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:15:34 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 318-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 15:51:47 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to review FR-7874 since the term “feeder equipment” is not defined within the NEC and may create confusion to the user of the code. The Correlating Committee directs that the last sentence of 550.33(A) be reviewed to determine if it is necessary since it does not supplement or modify the Chapter 2 general requirement for grounding.

First Revision No. 7874-NFPA 70-2020 [Detail]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1869-NFPA 70-2021 [Article 551]

Article 551 Recreational Vehicles and Recreational Vehicle Parks

Replace all uses of "Power-Supply Assembly" in this Article with "Feeder Assembly."

Part I. General

551.1 Scope.

This article covers the electrical conductors and equipment other than low-voltage and automotive vehicle circuits or extensions thereof, installed within or on recreational vehicles, the conductors that connect recreational vehicles to a supply of electricity, and the installation of equipment and devices related to electrical installations within a recreational vehicle park.

Informational Note: See NFPA 1192-2021, *Standard on Recreational Vehicles,* and ANSI/RVIA LV-2020, *Standard for Low Voltage Systems in Conversion and Recreational Vehicles*, for information on low-voltage systems.

551.3 Electrical Datum Plane Distances.

The electrical datum plane distance(s) is determined by the normal high water level and encompasses the areas subject to tidal movement and areas in which the water level is affected by the conditions such as climate (rain or snowfall) or by human intervention (the opening and closing of dams or floodgates). The distance does not consider extremes due to natural or manmade disasters.

(A) Areas Subject to Tidal Fluctuations.

In land areas subject to tidal fluctuation, the electrical datum plane shall be a horizontal plane that is 606 mm (2 ft) above the highest high tide level for the area occurring under normal circumstances.

(B) Areas Not Subject to Tidal Fluctuations.

In land areas not subject to tidal fluctuation, the electrical datum plane shall be a horizontal plane that is 606 mm (2 ft) above the normal high water level for the area occurring under normal circumstances.

551.4 General Requirements.

(A) Not Covered.

A recreational vehicle not used for the purposes as defined in 551.2 shall not be required to meet the requirements of Part IV pertaining to the number or capacity of circuits required. It shall, however, meet all other applicable requirements of this article if the recreational vehicle is provided with an electrical installation intended to be energized from a 120-volt, 208Y/120-volt, or 120/240-volt, nominal, ac power-supply system.

(B) Systems.

This article covers combination electrical systems, generator installations, and 120-volt, 208Y/120-volt, or 120/240-volt, nominal, systems.

Informational Note: See NFPA 1192-2021, *Standard on Recreational Vehicles*, and ANSI/RVIA 12V-2020, *Standard for Low Voltage Systems in Conversion and Recreational Vehicles*, for information on low-voltage systems.

(C) Labels.

Labels required by Article 551 shall be made of etched, metal-stamped, or embossed brass; stainless steel; plastic laminates not less than 0.13 mm (0.005 in.) thick; or anodized or alclad aluminum not less than 0.5 mm (0.020 in.) thick or the equivalent.

Informational Note: See ANSI Z535.4-2011, *Product Safety Signs and Labels*, for guidance on other label criteria used in the recreational vehicle industry.

Part II. Combination Electrical Systems

551.20 Combination Electrical Systems.

(A) General.

Vehicle wiring suitable for connection to a battery or dc supply source shall be permitted to be connected to a 120-volt source, provided the entire wiring system and equipment are rated and installed in full conformity with Parts I, II, III, IV, and V requirements of this article covering 120-volt electrical systems. Circuits fed from ac transformers shall not supply dc appliances.

(B) Voltage Converters (120-Volt Alternating Current to Low-Voltage Direct Current).

The 120-volt ac side of the voltage converter shall be wired in full conformity with the requirements of Parts I, II, and IV of this article for 120-volt electrical systems.

Exception: Converters supplied as an integral part of a listed appliance shall not be subject to 551.20(B).

All converters and transformers shall be listed for use in recreational vehicles and designed or equipped to provide overtemperature protection. To determine the converter rating, the following percentages shall be applied to the total connected load, including average battery-charging rate, of all 12-volt equipment:

The first 20 amperes of load at 100 percent plus

The second 20 amperes of load at 50 percent plus

All load above 40 amperes at 25 percent

Exception: A low-voltage appliance that is controlled by a momentary switch (normally open) that has no means for holding in the closed position or refrigerators with a 120-volt function shall not be considered as a connected load when determining the required converter rating. Momentarily energized appliances shall be limited to those used to prepare the vehicle for occupancy or travel.

(C) Bonding Voltage Converter Enclosures.

The non–current-carrying metal enclosure of the voltage converter shall be connected to the frame of the vehicle with a minimum 8 AWG copper conductor. The voltage converter shall be provided with a separate chassis bonding conductor that shall not be used as a current-carrying conductor.

(D) Dual-Voltage Fixtures, Including Luminaires or Appliances.

Fixtures, including luminaires, or appliances having both 120-volt and low-voltage connections shall be listed for dual voltage.

(E) Autotransformers.

Autotransformers shall not be used.

(F) Receptacles and Plug Caps.

Where a recreational vehicle is equipped with an ac system, a low-voltage system, or both, receptacles and plug caps of the low-voltage system shall differ in configuration from those of the ac system. Where a vehicle equipped with a battery or other low-voltage system has an external connection for low-voltage power, the connector shall have a configuration that will not accept ac power.

Part III. Other Power Sources

551.30 Generator Installations.

(A) Mounting.

Generators shall be mounted in such a manner as to be effectively bonded to the recreational vehicle chassis. The connection of the electrical system produced by the generator shall provide an effective ground-fault return path when operational.

(B) Generator Protection.

Equipment shall be installed to ensure that the current-carrying conductors from the engine generator and from an outside source are not connected to a vehicle circuit at the same time. Automatic transfer switches in such applications shall be listed for use in one of the following:

(1) Emergency systems

(2) Optional standby systems

Receptacles used as disconnecting means shall be accessible (as applied to wiring methods) and capable of interrupting their rated current without hazard to the operator.

(C) Installation of Storage Batteries and Generators.

Storage batteries and internal-combustion-driven generator units (subject to the provisions of this *Code*) shall be secured in place to avoid displacement from vibration and road shock.

(D) Ventilation of Generator Compartments.

Compartments accommodating internal-combustion-driven generator units shall be provided with ventilation in accordance with instructions provided by the manufacturer of the generator unit.

Informational Note: See NFPA 1192-2021, *Standard on Recreational Vehicles*, for generator compartment construction requirements.

(E) Supply Conductors.

The supply conductors from the engine generator to the first termination on the vehicle shall be of the stranded type and be installed in listed flexible conduit or listed liquidtight flexible conduit. The point of first termination shall be in one of the following:

(1) Panelboard

(2) Junction box with a blank cover

(3) Junction box with a receptacle

(4) Enclosed transfer switch

(5) Receptacle assembly listed in conjunction with the generator

The panelboard, enclosed transfer switch, or junction box with a receptacle shall be installed within 450 mm (18 in.) of the point of entry of the supply conductors into the vehicle. A junction box with a blank cover shall be mounted on the compartment wall inside or outside the compartment; to any part of the generator-supporting structure (but not to the generator); to the vehicle floor on the outside of the vehicle; or within 450 mm (18 in.) of the point of entry of the supply conductors into the vehicle. A receptacle assembly listed in conjunction with the generator shall be mounted in accordance with its listing.

551.31 Multiple Supply Source.

(A) Multiple Supply Sources.

Where a multiple supply system consisting of an alternate power source and a power-supply cord is installed, the feeder from the alternate power source shall be protected by an overcurrent protective device. Installation shall be in accordance with 551.30(A), 551.30(B), and 551.40.

(B) Multiple Supply Sources Capacity.

The multiple supply sources shall not be required to be of the same capacity.

(C) Alternate Power Sources Exceeding 30 Amperes.

If an alternate power source exceeds 30 amperes, 120 volts, nominal, it shall be permissible to wire it as a 120-volt, nominal, system, a 208Y/120-volt, nominal, system, or a 120/240-volt, nominal, system, provided an overcurrent protective device of the proper rating is installed in the feeder.

(D) Power-Supply Assembly Not Less Than 30 Amperes.

The external power-supply assembly shall be permitted to be less than the calculated load but not less than 30 amperes and shall have overcurrent protection not greater than the capacity of the external power-supply assembly.

551.32 Other Sources.

Other sources of ac power, such as inverters, motor generators, or engine generators, shall be listed for use in recreational vehicles and shall be installed in accordance with the terms of the listing. Other sources of ac power shall be wired in full conformity with the requirements in Parts I, II, III, IV, and V of this article covering 120-volt electrical systems.

551.33 Alternate Source Restrictions.

Transfer equipment, if not integral with the listed power source, shall be installed to ensure that the current-carrying conductors from other sources of ac power and from an outside source are not connected to the vehicle circuit at the same time. Automatic transfer switches in such applications shall be listed for use in one of the following:

(1) Emergency systems

(2) Optional standby systems

Part IV. Nominal 120-Volt or 120/240-Volt Systems

551.40 120-Volt or 120/240-Volt, Nominal, Systems.

(A) General Requirements.

The electrical equipment and material of recreational vehicles indicated for connection to a wiring system rated 120 volts, nominal, 2-wire with equipment grounding conductor, or a wiring system rated 120/240 volts, nominal, 3-wire with equipment grounding conductor, shall be listed and installed in accordance with Parts I, II, III, IV, and V of this article. Electrical equipment connected line-to-line shall have a nominal voltage rating of 208–230 volts.

(B) Materials and Equipment.

Electrical materials, devices, appliances, fittings, and other equipment installed in, intended for use in, or attached to the recreational vehicle shall be listed. All products shall be used only in the manner in which they have been tested and found suitable for the intended use.

(C) Ground-Fault Circuit-Interrupter Protection.

The internal wiring of a recreational vehicle having only one 15- or 20-ampere branch circuit as permitted in 551.42(A) and (B) shall have ground-fault circuit-interrupter protection for personnel. The ground-fault circuit interrupter shall be installed at the point where the power supply assembly terminates within the recreational vehicle. Where a separable cord set is not employed, the ground-fault circuit interrupter shall be permitted to be an integral part of the attachment plug of the power supply assembly. The ground-fault circuit interrupter shall provide protection also under the conditions of an open grounded circuit conductor, interchanged circuit conductors, or both.

(D) Loss of Ground Device.

A device listed to indicate loss of ground shall be installed directly adjacent to the recreational vehicle entrance so that the external indicator display is visible prior to entry into the recreational vehicle.

The device shall provide a continuous visible or audible signal response to the loss of ground.

551.41 Receptacle Outlets Required.

(A) Spacing.

Receptacle outlets shall be installed at wall spaces 600 mm (2 ft) wide or more so that no point along the floor line is more than 1.8 m (6 ft), measured horizontally, from an outlet in that space.

Exception No. 1: Bath and hallway areas shall not be required to comply with 551.41(A).

Exception No. 2: Wall spaces occupied by kitchen cabinets, wardrobe cabinets, built-in furniture, behind doors that can open fully against a wall surface, or similar facilities shall not be required to comply with 551.41(A).

Exception No. 3: Wall spaces in the special transportation area of a recreational vehicle designed to transport internal combustion vehicles shall not be required to comply with 551.41(A).

(B) Location.

Receptacle outlets shall be installed as follows:

(1) Adjacent to countertops in the kitchen [at least one on each side of the sink if countertops are on each side and are 300 mm (12 in.) or over in width and depth].

(2) Adjacent to the refrigerator and gas range space, except where a gas-fired refrigerator or cooking appliance, requiring no external electrical connection, is factory installed.

(3) Adjacent to countertop spaces of 300 mm (12 in.) or more in width and depth that cannot be reached from a receptacle required in 551.41(B)(1) by a cord of 1.8 m (6 ft) without crossing a traffic area, cooking appliance, or sink.

(4) Rooftop decks that are accessible from inside the recreational vehicle shall have at least one receptacle installed within the perimeter of the rooftop deck. The receptacle shall not be located more than 1.2 m (4 ft) above the balcony, deck, or porch surface. The receptacle shall comply with the requirements of 406.9(B) for wet locations.

(5) A special transportation area of recreational vehicles designed to transport internal combustion engine vehicles shall have at least one receptacle installed.

(C) Ground-Fault Circuit-Interrupter Protection.

Where provided, each 125-volt, single-phase, 15- or 20-ampere receptacle outlet shall have ground-fault circuit-interrupter protection for personnel in the following locations:

(1) Adjacent to a bathroom lavatory

(2) Where the receptacles are installed to serve the countertop surfaces and are within 1.8 m (6 ft) of any lavatory or sink

Exception No. 1: Receptacles installed for appliances in dedicated spaces, such as for disposals, refrigerators, and freezers shall not require ground-fault circuit-interrupter protection.

Exception No. 2: Single receptacles for interior connections of expandable room sections shall not require ground-fault circuit-interrupter protection.

Exception No. 3: De-energized receptacles that are within 1.8 m (6 ft) of any sink or lavatory due to the retraction of the expandable room section shall not require ground-fault circuit-interrupter protection.

(3) In the area occupied by a toilet, shower, tub, or any combination thereof

(4) On the exterior of the vehicle

Exception: Receptacles that are located inside of an access panel that is installed on the exterior of the vehicle to supply power for an installed appliance shall not be required to have ground-fault circuit-interrupter protection.

(5) In the special transportation area of a recreational vehicle that is separated from the living area by a wall

The receptacle outlet shall be permitted in a listed luminaire. A receptacle outlet shall not be installed in a tub or combination tub–shower compartment.

(D) Face-Up Position.

A receptacle shall not be installed in a face-up position in any countertop or similar horizontal surface.

551.42 Branch Circuits Required.

Each recreational vehicle containing an ac electrical system shall contain one of the circuit arrangements in 551.42(A) through (D).

(A) One 15-Ampere Circuit.

One 15-ampere circuit to supply lights, receptacle outlets, and fixed appliances. Such recreational vehicles shall be equipped with one 15-ampere switch and fuse or one 15-ampere circuit breaker.

(B) One 20-Ampere Circuit.

One 20-ampere circuit to supply lights, receptacle outlets, and fixed appliances. Such recreational vehicles shall be equipped with one 20-ampere switch and fuse or one 20-ampere circuit breaker.

(C) Two to Five 15- or 20-Ampere Circuits.

Two to five 15- or 20-ampere circuits to supply lights, receptacle outlets, and fixed appliances shall be permitted. Such recreational vehicles shall be permitted to be equipped with panelboards rated 120 volt maximum or 120/240 volt maximum and listed for 30-ampere application supplied by the appropriate power-supply assemblies. Not more than two 120-volt thermostatically controlled appliances shall be installed in such systems unless appliance isolation switching, energy management systems, or similar methods are used.

Exception No. 1: Additional 15- or 20-ampere circuits shall be permitted where a listed energy management system rated at 30-ampere maximum is employed within the system.

Exception No. 2: Six 15- or 20-ampere circuits shall be permitted without employing an energy management system, provided that the added sixth circuit serves only the power converter, and the combined load of all six circuits does not exceed the allowable load that was designed for use by the original five circuits.

Informational Note: See 210.23(B) for permissible loads. See 551.45(C) for main disconnect and overcurrent protection requirements.

(D) More Than Five Circuits Without a Listed Energy Management System.

A 50-ampere, 120/208–240-volt power-supply assembly and a minimum 50-ampere-rated panelboard shall be used where six or more circuits are employed. The load distribution shall ensure a reasonable current balance between phases.

551.43 Branch-Circuit Protection.

(A) Rating.

The branch-circuit overcurrent devices shall be rated as follows:

(1) Not more than the circuit conductors, and

(2) Not more than 150 percent of the rating of a single appliance rated 13.3 amperes or more and supplied by an individual branch circuit, but

(3) Not more than the overcurrent protection size marked on an air conditioner or other motor-operated appliances

(B) Protection for Smaller Conductors.

A 20-ampere fuse or circuit breaker shall be permitted for protection for fixtures, including luminaires, leads, cords, or small appliances, and 14 AWG tap conductors, not over 1.8 m (6 ft) long for recessed luminaires.

(C) Fifteen-Ampere Receptacles Considered Protected by 20 Amperes.

If more than one receptacle or load is on a branch circuit, 15-ampere receptacles shall be permitted to be protected by a 20-ampere fuse or circuit breaker.

551.44 Power-Supply Assembly.

Each recreational vehicle shall have only one of the main power-supply assemblies covered in 551.44(A) through (D).

(A) Fifteen-Ampere Main Power-Supply Assembly.

Recreational vehicles wired in accordance with 551.42(A) shall use a listed 15-ampere or larger main power-supply assembly.

(B) Twenty-Ampere Main Power-Supply Assembly.

Recreational vehicles wired in accordance with 551.42(B) shall use a listed 20-ampere or larger main power-supply assembly.

(C) Thirty-Ampere Main Power-Supply Assembly.

Recreational vehicles wired in accordance with 551.42(C) shall use a listed 30-ampere or larger main power-supply assembly.

(D) Fifty-Ampere Power-Supply Assembly.

Recreational vehicles wired in accordance with 551.42(D) shall use a listed 50-ampere, 120/208–240-volt main power-supply assembly.

551.45 Panelboard.

(A) Listed and Appropriately Rated.

A listed and appropriately rated panelboard or other equipment specifically listed for this purpose shall be used. The grounded conductor termination bar shall be insulated from the enclosure as provided in 551.54(C). An equipment grounding terminal bar shall be attached inside the enclosure of the panelboard.

(B) Location.

The panelboard shall be installed in a readily accessible location with the RV in the setup mode. Working clearance for the panelboard with the RV in the setup mode shall be not less than 600 mm (24 in.) wide and 750 mm (30 in.) deep.

Exception No. 1: Where the panelboard cover is exposed to the inside aisle space, one of the working clearance dimensions shall be permitted to be reduced to a minimum of 550 mm (22 in.). A panelboard is considered exposed where the panelboard cover is within 50 mm (2 in.) of the aisle's finished surface or not more than 25 mm (1 in.) from the backside of doors that enclose the space.

Exception No. 2: Compartment doors used for access to a generator shall be permitted to be equipped with a locking system.

(C) Dead-Front Type.

The panelboard shall be of the dead-front type and shall consist of one or more circuit breakers or Type S fuseholders. A main disconnecting means shall be provided where fuses are used or where more than two circuit breakers are employed. A main overcurrent protective device not exceeding the power-supply assembly rating shall be provided where more than two branch circuits are employed.

551.46 Means for Connecting to Power Supply.

(A) Assembly.

The power-supply assembly or assemblies shall be factory supplied or factory installed and be of one of the types specified herein.

(1) Separable.

Where a separable power-supply assembly consisting of a cord with a female connector and molded attachment plug cap is provided, the vehicle shall be equipped with a permanently mounted, flanged surface inlet (male, recessed-type motor-base attachment plug) wired directly to the panelboard by an approved wiring method. The attachment plug cap shall be of a listed type.

(2) Permanently Connected.

Each power-supply assembly shall be connected directly to the terminals of the panelboard or conductors within a junction box and provided with means to prevent strain from being transmitted to the terminals. The ampacity of the conductors between each junction box and the terminals of each panelboard shall be at least equal to the ampacity of the power-supply cord. The supply end of the assembly shall be equipped with an attachment plug of the type described in 551.46(C). Where the cord passes through the walls or floors, it shall be protected by means of conduit and bushings or equivalent. The cord assembly shall have permanent provisions for protection against corrosion and mechanical damage while the vehicle is in transit and while the cord assembly is being stored or removed for use.

(B) Cord.

The cord exposed usable length shall be measured from the point of entrance to the recreational vehicle or the face of the flanged surface inlet (motor-base attachment plug) to the face of the attachment plug at the supply end.

The cord exposed usable length, measured to the point of entry on the vehicle exterior, shall be a minimum of 7.5 m (25 ft) where the point of entrance is at the side of the vehicle or shall be a minimum 9.0 m (30 ft) where the point of entrance is at the rear of the vehicle.

Where the cord entrance into the vehicle is more than 900 mm (3 ft) above the ground, the minimum cord lengths above shall be increased by the vertical distance of the cord entrance heights above 900 mm (3 ft).

> Informational Note: See 551.46(E) for location of point of entrance of a power-supply assembly on the recreational vehicle exterior.

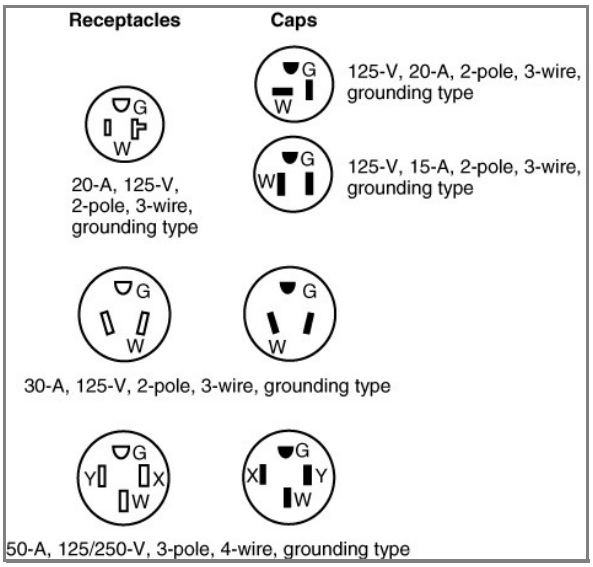
(C) Attachment Plugs.

(1) Units with One 15-Ampere Branch Circuit.

Recreational vehicles having only one 15-ampere branch circuit as permitted by 551.42(A) shall have an attachment plug that shall be 2-pole, 3-wire grounding type, rated 15 amperes, 125 volts, conforming to the configuration shown in Figure 551.46(C)(1).

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure 5.15, for complete details of this configuration.

Figure 551.46(C)(1) Configurations for Grounding-Type Receptacles and Attachment Plug Caps Used for Recreational Vehicle Supply Cords and Recreational Vehicle Lots.



(2) Units with One 20-Ampere Branch Circuit.

Recreational vehicles having only one 20-ampere branch circuit as permitted in 551.42(B) shall have an attachment plug that shall be 2-pole, 3-wire grounding type, rated 20 amperes, 125 volts, conforming to the configuration shown in Figure 551.46(C)(1).

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure 5.20, for complete details of this configuration.

(3) Units with Two to Five 15- or 20-Ampere Branch Circuits.

Recreational vehicles wired in accordance with 551.42(C) shall have an attachment plug that shall be 2-pole, 3-wire grounding type, rated 30 amperes, 125 volts, conforming to the configuration shown in Figure 551.46(C)(1) intended for use with units rated at 30 amperes, 125 volts.

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure TT, for complete details of this configuration.

(4) Units with 50-Ampere Power-Supply Assembly.

Recreational vehicles having a power-supply assembly rated 50 amperes as permitted by 551.42(D) shall have a 3-pole, 4-wire grounding-type attachment plug rated 50 amperes, 125/250 volts, conforming to the configuration shown in Figure 551.46(C)(1).

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure 14.50, for complete details of this configuration.

(D) Labeling at Electrical Entrance.

Each recreational vehicle shall have a safety label with the signal word WARNING in minimum 6-mm (1/4 -in.) high letters and body text in minimum 3-mm (1/8 -in.) high letters on a contrasting background. The safety label shall be affixed to the exterior skin, at or near the point of entrance of the power-supply cord(s), and shall read, using one of the following warnings, as appropriate:

WARNING

THIS CONNECTION IS FOR 110–125-VOLT AC,

60 HZ, ____ AMPERE SUPPLY.

DO NOT EXCEED CIRCUIT RATING.

EXCEEDING THE CIRCUIT RATING CAN CAUSE A

FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

or

WARNING

THIS CONNECTION IS FOR 208Y/120-VOLT or

120/240-VOLT AC, 3-POLE, 4-WIRE, 60 HZ, _____ AMPERE SUPPLY.

DO NOT EXCEED CIRCUIT RATING.

EXCEEDING THE CIRCUIT RATING CAN CAUSE A

FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

The correct ampere rating shall be marked in the blank space.

(E) Location.

The point of entrance of a power-supply assembly shall be located within 4.5 m (15 ft) of the rear, on the left (road) side or at the rear, left of the longitudinal center of the vehicle, within 450 mm (18 in.) of the outside wall.

Exception No. 1: A recreational vehicle equipped with only a listed flexible drain system or a side-vent drain system shall be permitted to have the electrical point of entrance located on either side, provided the drain(s) for the plumbing system is (are) located on the same side.

Exception No. 2: A recreational vehicle shall be permitted to have the electrical point of entrance located more than 4.5 m (15 ft) from the rear. Where this occurs, the distance beyond the 4.5-m (15-ft) dimension shall be added to the cord's minimum length as specified in 551.46(B).

Exception No. 3: Recreational vehicles designed for transporting livestock shall be permitted to have the electrical point of entrance located on either side or the front.

551.47 Wiring Methods.

(A) Wiring Systems.

Cables and raceways installed in accordance with Articles 320, 322, 330 through 340, 342 through 362, 386, and 388 shall be permitted in accordance with their applicable article, except as otherwise specified in this article. An equipment grounding means shall be provided in accordance with 250.118.

(B) Conduit and Tubing.

Where rigid metal conduit or intermediate metal conduit is terminated at an enclosure with a locknut and bushing connection, two locknuts shall be provided, one inside and one outside of the enclosure. All cut ends of conduit and tubing shall be reamed or otherwise finished to remove rough edges.

(C) Nonmetallic Boxes.

Nonmetallic boxes shall be acceptable only with nonmetallic-sheathed cable or nonmetallic raceways.

(D) Boxes.

In walls and ceilings constructed of wood or other combustible material, boxes and fittings shall be flush with the finished surface or project therefrom.

(E) Mounting.

Wall and ceiling boxes shall be mounted in accordance with 314.23.

Exception No. 1: Snap-in-type boxes or boxes provided with special wall or ceiling brackets that securely fasten boxes in walls or ceilings shall be permitted.

Exception No. 2: A wooden plate providing a 38-mm (1 1/2-in.) minimum width backing around the box and of a thickness of 13 mm (1/2 in.) or greater (actual) attached directly to the wall panel shall be considered as approved means for mounting outlet boxes.

(F) Raceway and Cable Continuity.

Raceways and cable sheaths shall be continuous between boxes and other enclosures.

(G) Protected.

Metal-clad, Type AC, or nonmetallic-sheathed cables and electrical nonmetallic tubing shall be permitted to pass through the centers of the wide side of 2 by 4 wood studs. However, they shall be protected where they pass through 2 by 2 wood studs or at other wood studs or frames where the cable or tubing would be less than 32 mm (1 1/4 in.) from the inside or outside surface. Steel plates on each side of the cable or tubing or a steel tube, with not less than 1.35 mm (0.053 in.) wall thickness, shall be installed to protect the cable or tubing. These plates or tubes shall be securely held in place. Where nonmetallic-sheathed cables pass through punched, cut, or drilled slots or holes in metal members, the cable shall be protected by bushings or grommets securely fastened in the opening prior to installation of the cable.

(H) Bends.

No bend shall have a radius of less than five times the cable diameter.

(I) Cable Supports.

Where connected with cable connectors or clamps, cables shall be secured and supported within 300 mm (12 in.) of outlet boxes, panelboards, and splice boxes on appliances. Supports and securing shall be provided at intervals not exceeding 1.4 m (4 1/2 ft) at other places.

(J) Nonmetallic Box Without Cable Clamps.

Nonmetallic-sheathed cables shall be secured and supported within 200 mm (8 in.) of a nonmetallic outlet box without cable clamps. Where wiring devices with integral enclosures are employed with a loop of extra cable to permit future replacement of the device, the cable loop shall be considered as an integral portion of the device.

(K) Physical Damage.

Where subject to physical damage, exposed nonmetallic cable shall be protected by covering boards, guard strips, raceways, or other means.

(L) Receptacle Faceplates.

Metal faceplates shall comply with 406.6(A). Nonmetallic faceplates shall comply with 406.6(C).

(M) Metal Faceplates Grounded.

Metal faceplates shall be installed in compliance with 404.9(B) and 404.6(B).

(N) Moisture or Physical Damage.

Where outdoor or under-chassis line-voltage (120 volts, nominal, or higher) wiring is exposed to moisture or physical damage, it shall be protected by a conduit or raceway identified for use in wet locations and be closely routed against frames and equipment enclosures or other raceway or cable identified for the application. The conductors shall be listed for use in wet locations.

(O) Component Interconnections.

Fittings and connectors that are intended to be concealed at the time of assembly shall be listed and identified for the interconnection of building components. Such fittings and connectors shall be equal to the wiring method employed in insulation, temperature rise, and fault-current withstanding and shall be capable of enduring the vibration and shock occurring in recreational vehicles.

(P) Method of Connecting Expandable Units.

The method of connecting expandable units to the main body of the vehicle shall comply with 551.47(P)(1) or (P)(2).

(1) Cord-and-Plug-Connected.

Cord-and-plug connections shall comply with 551.47(P)(1) (a) through (P)(1)(d).

(1) That portion of a branch circuit that is installed in an expandable unit shall be permitted to be connected to the portion of the branch circuit in the main body of the vehicle by means of an attachment plug and cord listed for hard usage. The cord and its connections shall comply with Part I and Part II, as applicable, of Article 400 and shall be considered as a permitted use under 400.10 . Where the attachment plug and cord are located within the vehicle's interior, use of plastic thermoset or elastomer parallel cord Type SPT-3, SP-3, or SPE shall be permitted.

(2) Where the receptacle provided for connection of the cord to the main circuit is located on the outside of the vehicle, it shall be protected with a ground-fault circuit interrupter for personnel and be listed for wet locations. A cord located on the outside of a vehicle shall be identified for outdoor use.

(3) Unless removable or stored within the vehicle interior, the cord assembly shall have permanent provisions for protection against corrosion and mechanical damage while the vehicle is in transit.

(4) The attachment plug and cord shall be installed so as not to permit exposed live attachment plug pins.

(2) Direct Wired.

That portion of a branch circuit that is installed in an expandable unit shall be permitted to be connected to the portion of the branch circuit in the main body of the vehicle by means of flexible cord installed in accordance with 551.47(P)(2)(a) through (P)(2)(e) or other approved wiring method.

(1) The flexible cord shall be listed for hard usage and for use in wet locations.

(2) The flexible cord shall be permitted to be exposed on the underside of the vehicle.

(3) The flexible cord shall be permitted to pass through the interior of a wall or floor assembly or both a maximum concealed length of 600 mm (24 in.) before terminating at an outlet or junction box.

(4) Where concealed, the flexible cord shall be installed in nonflexible conduit or tubing that is continuous from the outlet or junction box inside the recreational vehicle to a weatherproof outlet box, junction box, or strain relief fitting listed for use in wet locations that is located on the underside of the recreational vehicle. The outer jacket of the flexible cord shall be continuous into the outlet or junction box.

(5) Where the flexible cord passes through the floor to an exposed area inside of the recreational vehicle, it shall be protected by means of conduit and bushings or equivalent.

Where subject to physical damage, the flexible cord shall be protected with RMC, IMC, Schedule 80 PVC, reinforced thermosetting resin conduit (RTRC) listed for exposure to physical damage, or other approved means and shall extend at least 150 mm (6 in.) above the floor. A means shall be provided to secure the flexible cord where it enters the recreational vehicle.

(Q) Prewiring for Air-Conditioning Installation.

Prewiring installed for the purpose of facilitating future air-conditioning installation shall comply with the applicable portions of this article and the following:

(1) An overcurrent protective device with a rating compatible with the circuit conductors shall be installed in the panelboard and wiring connections completed.

(2) The load end of the circuit shall terminate in a junction box with a blank cover or other listed enclosure. Where a junction box with a blank cover is used, the free ends of the conductors shall be adequately capped or taped.

(3) A safety label with the signal word WARNING in minimum 6-mm (1/4 -in.) high letters and body text in minimum 3-mm (1/8 -in.) high letters on a contrasting background shall be affixed on or adjacent to the junction box and shall read as follows:

WARNING

AIR-CONDITIONING CIRCUIT.

THIS CONNECTION IS FOR AIR CONDITIONERS

RATED 110–125-VOLT AC, 60 HZ,

___ AMPERES MAXIMUM.

DO NOT EXCEED CIRCUIT RATING.

EXCEEDING THE CIRCUIT RATING MAY

CAUSE A FIRE AND RESULT IN DEATH

OR SERIOUS INJURY.

An ampere rating, not to exceed 80 percent of the circuit rating, shall be legibly marked in the blank space.

(4) The circuit shall serve no other purpose.

(R) Prewiring for Generator Installation.

Prewiring installed for the purpose of facilitating future generator installation shall comply with the other applicable portions of this article and the following:

(1) Circuit conductors shall be appropriately sized in relation to the anticipated load as stated on the label required in 551.47(R)(4).

(2) Where junction boxes are utilized at either of the circuit originating or terminus points, free ends of the conductors shall be adequately capped or taped.

(3) Where devices such as receptacle outlet, transfer switch, and so forth, are installed, the installation shall be complete, including circuit conductor connections.

(4) A safety label with the signal word WARNING in minimum 6 mm (1/4 in.) high letters and body text in minimum 3 mm (1/8 in.) high letters on a contrasting background shall be affixed on the cover of each junction box or transfer switch containing incomplete circuitry and shall read, using one of the following warnings, as appropriate:

WARNING

GENERATOR

ONLY INSTALL A GENERATOR LISTED

SPECIFICALLY FOR RV USE

HAVING OVERCURRENT PROTECTION

RATED 110–125-VOLT AC,

60 HZ,_____ AMPERES MAXIMUM.

or

WARNING

GENERATOR

ONLY INSTALL A GENERATOR LISTED

SPECIFICALLY FOR RV USE

HAVING OVERCURRENT PROTECTION

RATED 120–240-VOLT AC,

60 HZ, _____ AMPERES MAXIMUM.

The correct ampere rating shall be legibly marked in the blank space.

(S) Prewiring for Other Circuits.

Prewiring installed for the purpose of installing other appliances or devices shall comply with the applicable portions of this article and the following:

(1) An overcurrent protection device with a rating compatible with the circuit conductors shall be installed in the panelboard with wiring connections completed.

(2) The load end of the circuit shall terminate in a junction box with a blank cover or a device listed for the purpose. Where a junction box with blank cover is used, the free ends of the conductors shall be adequately capped or taped.

(3) A safety label with the signal word WARNING in minimum 6-mm (**1**⁄**4** -in.) high letters and body text in minimum 3-mm (**1**⁄**8** -in.) high letters on a contrasting background shall be affixed on or adjacent to the junction box or device listed for the purpose and shall read as follows:

WARNING

THIS CONNECTION IS FOR _____ RATED _____ VOLT AC, 60 HZ, _____ AMPERES MAXIMUM. DO NOT EXCEED CIRCUIT RATING.

EXCEEDING THE CIRCUIT RATING MAY

CAUSE A FIRE AND RESULT IN DEATH OR

SERIOUS INJURY.

An ampere rating not to exceed 80 percent of the circuit rating shall be legibly marked in the blank space.

551.48 Conductors and Boxes.

The maximum number of conductors permitted in boxes shall be in accordance with 314.16 .

551.49 Grounded Conductors.

The identification of grounded conductors shall be in accordance with 200.6 .

551.50 Connection of Terminals and Splices.

Conductor splices and connections at terminals shall be in accordance with 110.14 .

551.51 Switches.

(A) Rating.

Switches shall be rated in accordance with 551.51(A)(1) and (A)(2).

(1) Lighting Circuits.

For lighting circuits, switches shall be rated not less than 10 amperes, 120–125 volts and in no case less than the connected load.

(2) Motors or Other Loads.

Switches for motors or other loads shall comply with 404.14 .

(B) Location.

Switches shall not be installed within wet locations in tub or shower spaces unless installed as part of a listed tub or shower assembly.

551.52 Receptacles.

All receptacle outlets shall be of the grounding type and installed in accordance with 406.4 and 210.21 .

551.53 Luminaires and Other Equipment.

(A) General.

Any combustible wall or ceiling finish exposed between the edge of a canopy or pan of a luminaire or ceiling-suspended (paddle) fan and the outlet box shall be covered with noncombustible material.

(B) Shower Luminaires.

If a luminaire is provided over a bathtub or in a shower stall, it shall be of the enclosed and gasketed type and listed for the type of installation, and it shall be ground-fault circuit-interrupter protected.

(C) Outdoor Outlets, Luminaires, Air-Cooling Equipment, and So On.

Outdoor luminaires and other equipment shall be listed for outdoor use.

551.54 Grounding.

(See also 551.56 on bonding of non–current-carrying metal parts.)

(A) Power-Supply Grounding.

The equipment grounding conductor in the supply cord or feeder shall be connected to the equipment grounding bus or other approved equipment grounding means in the panelboard.

(B) Panelboard.

The panelboard shall have an equipment grounding bus with terminals for all equipment grounding conductors or other approved equipment grounding means.

(C) Insulated Neutral Conductor.

The neutral conductor shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts. The neutral conductor terminals in the panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps, or buses in the panelboard or in appliances shall be removed and discarded. Connection of electric ranges and electric clothes dryers utilizing a grounded conductor, if cord-connected, shall be made with 4-conductor cord and 3-pole, 4-wire grounding-type plug caps and receptacles.

551.55 Interior Equipment Grounding.

(A) Exposed Metal Parts.

In the electrical system, all exposed metal parts, enclosures, frames, luminaire canopies, and so forth, shall be effectively bonded to the grounding terminals or enclosure of the panelboard.

(B) Equipment Grounding and Bonding Conductors.

Bare wires, insulated wire with an outer finish that is green or green with one or more yellow stripes, shall be used for equipment grounding or bonding conductors only.

(C) Grounding of Electrical Equipment.

Grounding of electrical equipment shall be accomplished by one or more of the following methods:

(1) Connection of metal raceway, the sheath of Type MC and Type MI cable where the sheath is identified for grounding, or the armor of Type AC cable to metal enclosures.

(2) A connection between the one or more equipment grounding conductors and a metal enclosure by means of a grounding screw, which shall be used for no other purpose, or a listed grounding device.

(3) The equipment grounding conductor in nonmetallic-sheathed cable shall be permitted to be secured under a screw threaded into the luminaire canopy other than a mounting screw or cover screw, or attached to a listed grounding means (plate) in a nonmetallic outlet box for luminaire mounting. [Grounding means shall also be permitted for luminaire attachment screws.]

(D) Grounding Connection in Nonmetallic Box.

A connection between the one or more equipment grounding conductors brought into a nonmetallic outlet box shall be so arranged that a connection of the equipment grounding conductor can be made to any fitting or device in that box that requires grounding.

(E) Grounding Continuity.

Where more than one equipment grounding or bonding conductor of a branch circuit enters a box, all such conductors shall be connected together using a method specified in 250.8 , and the arrangement shall be such that the disconnection or removal of a receptacle, luminaire, or other device fed from the box will not interfere with or interrupt the grounding continuity.

(F) Cord-Connected Appliances.

Cord-connected appliances, such as washing machines, clothes dryers, refrigerators, and the electrical system of gas ranges, and so forth, shall be grounded by means of an approved cord with equipment grounding conductor and grounding-type attachment plug.

551.56 Bonding of Non–Current-Carrying Metal Parts.

(A) Required Bonding.

All exposed non–current-carrying metal parts that are likely to become energized shall be effectively bonded to the grounding terminal or enclosure of the panelboard.

(B) Bonding Chassis.

A bonding conductor shall be connected between any panelboard and an accessible terminal on the chassis. Bonding terminations shall be suitable for the enviroment in which the conductors and terminations are installed.

Exception: Any recreational vehicle that employs a unitized metal chassis-frame construction to which the panelboard is securely fastened with a bolt(s) and nut(s) or by welding or riveting shall be considered to be bonded.

(C) Bonding Conductor Requirements.

Grounding terminals shall be of the solderless type and listed as pressure terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare, and shall be 8 AWG copper minimum, or equal.

(D) Metallic Roof and Exterior Bonding.

The metal roof and exterior covering shall be considered bonded where both of the following conditions apply:

(1) The metal panels overlap one another and are securely attached to the wood or metal frame parts by metal fasteners.

(2) The lower panel of the metal exterior covering is secured by metal fasteners at each cross member of the chassis, or the lower panel is connected to the chassis by a metal strap.

(E) Gas, Water, and Waste Pipe Bonding.

The gas, water, and waste pipes shall be considered grounded if they are bonded to the chassis.

(F) Furnace and Metal Air Duct Bonding.

Furnace and metal circulating air ducts shall be bonded.

551.57 Appliance Accessibility and Fastening.

Every appliance shall be accessible for inspection, service, repair, and replacement without removal of permanent construction. Means shall be provided to securely fasten appliances in place when the recreational vehicle is in transit.

Part V. Factory Tests

551.60 Factory Tests (Electrical).

Each recreational vehicle designed with a 120-volt or a 120/240-volt electrical system shall withstand the applied voltage without electrical breakdown of a 1-minute, 900-volt ac or 1280-volt dc dielectric strength test, or a 1-second, 1080-volt ac or 1530-volt dc dielectric strength test, with all switches closed, between ungrounded and grounded conductors and the recreational vehicle ground. During the test, all switches and other controls shall be in the "on" position. Fixtures, including luminaires and permanently installed appliances, shall not be required to withstand this test. The test shall be performed after branch circuits are complete prior to energizing the system and again after all outer coverings and cabinetry have been secured. The dielectric test shall be performed in accordance with the test equipment manufacturer's written instructions.

Each recreational vehicle shall be subjected to all of the following:

(1) A continuity test to ensure that all metal parts are properly bonded

(2) Operational tests to demonstrate that all equipment is properly connected and in working order

(3) Polarity checks to determine that connections have been properly made

(4) GFCI test to demonstrate that the ground fault protection device(s) installed on the recreational vehicle are operating properly

Part VI. Recreational Vehicle Parks

551.71 Type Receptacles Provided.

(A) 20-Ampere.

Every recreational vehicle site with electrical supply shall be equipped with recreational vehicle site supply equipment with at least one 20-ampere, 125-volt weather-resistant receptacle. This receptacle, when used in recreational vehicle site electrical equipment, shall not be required to be tamper-resistant in accordance with 406.12 .

(B) 30-Ampere.

A minimum of 70 percent of all recreational vehicle sites with electrical supply shall each be equipped with a 30-ampere, 125-volt weather-resistant receptacle conforming to Figure 551.46(C)(1) . This supply shall be permitted to include additional receptacle configurations conforming to 551.81 . The remainder of all recreational vehicle sites with electrical supply shall be equipped with one or more of the receptacle configurations conforming to 551.81 .

(C) 50-Ampere.

A minimum of 20 percent of existing and 40 percent of all new recreational vehicle sites, with electrical supply, shall each be equipped with a 50-ampere, 125/250-volt receptacle conforming to the configuration as identified in Figure 551.46(C)(1) . Every recreational vehicle site equipped with a 50-ampere receptacle shall also be equipped with a 30-ampere, 125-volt receptacle conforming to Figure 551.46(C)(1) . These electrical supplies shall be permitted to include additional receptacles that have configurations in accordance with 551.81 .

Informational Note: The percentage of 50 ampere sites required by 551.71 could be inadequate for seasonal recreational vehicle sites serving a higher percentage of recreational vehicles with 50-ampere electrical systems. In that type of recreational vehicle park, the percentage of 50-ampere sites could approach 100 percent.

(D) Tent Sites.

Dedicated tent sites with a 15- or 20-ampere electrical supply shall be permitted to be excluded when determining the percentage of recreational vehicle sites with 30- or 50-ampere receptacles.

(E) Additional Receptacles.

Additional receptacles shall be permitted for the connection of electrical equipment outside the recreational vehicle within the recreational vehicle park.

(F) GFCI Protection.

Ground-fault circuit-interrupter protection shall be provided as required in 210.8(B) . GFCI protection shall not be required for other than 125-volt, 15- and 20-ampere receptacles used in the recreational vehicle site equipment.

Informational Note No. 1: Appliances used within the recreational vehicle can create leakage current levels at the supply receptacle(s) that could exceed the limits of a Class A GFCI device.

Informational Note No. 2: The definition of *Power-Supply Assembly* in 551.2 and the definition of *Feeder* in Article 100 clarifies that the power supply cord to a recreational vehicle is considered a feeder.

551.72 Distribution System.

(A) Systems.

Distribution systems shall provide the voltage and have a capacity for the receptacles provided in the recreational vehicle (RV) site supply equipment as calculated according to 551.73 and shall have an ampacity not less than 30 amperes. Systems permitted include single-phase 120 volts, single-phase 120/240 volts, or single-phase 120/208 volts — two ungrounded and one neutral conductor taken from a 208Y/120-volt system.

(B) Three-Phase Systems.

Feeders from 208Y/120-volt, 3-phase systems shall be permitted to include two ungrounded conductors and shall include one grounded conductor and one equipment grounding conductor. So far as practicable, the loads shall be equally distributed on the 3-phase system.

(C) Receptacles.

Receptacles rated at 50 amperes shall be supplied from a branch circuit of the voltage class and rating of the receptacle. Other recreational vehicle sites with 125-volt, 20- and 30-ampere receptacles shall be permitted to be derived from any grounded distribution system that supplies 120-volt, single-phase power.

(D) Neutral Conductors.

Neutral conductors shall be permitted to be reduced in size below the minimum required size of the ungrounded conductors for 240-volt, line-to-line, permanently connected loads only. The neutral conductors shall not be reduced in size below the size of the ungrounded conductors for the site distribution.

Informational Note No. 1: All loads in a recreational vehicle are 120-volt, line-to-neutral and are nonpermanently connected loads.

Informational Note No. 2: Due to the long circuit lengths typical in most recreational vehicle parks, feeder conductor sizes found in the ampacity tables of Article 310 may be inadequate to maintain the voltage regulation suggested in 215.2(A)(1) Informational Note No. 2. Total circuit voltage drop is a sum of the voltage drops of each serial circuit segment, where the load for each segment is calculated using the load that segment sees and the demand factors shown in Table 551.73(A) .

(E) Connected Devices.

The use of autotransformers shall not be permitted. The use of listed surge protective devices shall be permitted.

(F) Connection to Recreational Vehicle Site Equipment.

Each recreational vehicle shall be powered by only one 30-ampere or one 50-ampere external power supply cord.

Informational Note: The requirement in 551.72(F) does not preclude the use of the 15- or 20-ampere receptacle convenience outlet on the recreational vehicle supply equipment.

551.73 Calculated Load.

(A) Basis of Calculations.

Electrical services and feeders shall be calculated on the basis of not less than all of the following:

(1) 12,000 volt-amperes per site equipped with 50-ampere, 208Y/120-volt or 120/240-volt supply facilities

(2) 3600 volt-amperes per site equipped with both 20-ampere and 30-ampere supply facilities

(3) 2400 volt-amperes per site equipped with only 20-ampere supply facilities

(4) 600 volt-amperes per site equipped with only 20-ampere supply facilities that are dedicated to tent sites

The demand factors set forth in Table 551.73(A) shall be the minimum allowable demand factors that shall be permitted in calculating load for service and feeders. Where the electrical supply for a recreational vehicle site has more than one receptacle.

Where the electrical supply is in a location that serves two recreational vehicles, the equipment for both sites shall comply with 551.77 , and the calculated load shall only be calculated for the two receptacles with the highest rating.

(B) Demand Factors.

The demand factor for a given number of sites shall apply to all sites indicated. For example, 20 sites calculated at 45 percent of 3600 volt-amperes results in a permissible demand of 1620 volt-amperes per site or a total of 32,400 volt-amperes for 20 sites.

Informational Note: These demand factors may be inadequate in areas of extreme hot or cold temperature with loaded circuits for heating or air conditioning.

Table 551.73(A) Demand Factors for Site Feeders and Service-Entrance Conductors for Park Sites

Number of Recreational Vehicle Sites	Demand Factor (%)
1	100
2	90
3	80
4	75
5	65
6	60
7–9	55
10–12	50
13–15	48
16–18	47
19–21	45
22–24	43
25–35	42
36 plus	41

Loads for other amenities such as, but not limited to, service buildings, recreational buildings, and swimming pools shall be calculated separately and then be added to the value calculated for the recreational vehicle sites where they are all supplied by a common service.

551.74 Overcurrent Protection.

Overcurrent protection shall be provided in accordance with Article 240 .

551.76 Grounding — Recreational Vehicle Site Supply Equipment.

(A) Grounding Electrode.

Recreational vehicle site supply equipment, other than those used as service equipment, shall not be required to have a grounding electrode. An auxiliary grounding electrode(s) in accordance with 250.54 shall be permitted to be installed.

(B) Exposed Non–Current-Carrying Metal Parts.

Exposed non–current-carrying metal parts of fixed equipment, metal boxes, cabinets, and fittings that are not electrically connected to grounded equipment shall be grounded by an equipment grounding conductor run with the circuit conductors from the service equipment or from the transformer of a secondary distribution system. Equipment grounding conductors shall be sized in accordance with 250.122 and shall be permitted to be spliced by listed means.

The arrangement of equipment grounding connections shall be such that the disconnection or removal of a receptacle or other device will not interfere with, or interrupt, the grounding continuity.

(C) Secondary Distribution System.

Each secondary distribution system shall be grounded at the transformer.

(D) Grounded Conductor Not to Be Used as an Equipment Ground.

The grounded conductor shall not be used as an equipment grounding conductor for recreational vehicles or equipment within the recreational vehicle park.

(E) No Connection on the Load Side.

No connection to a grounding electrode shall be made to the grounded conductor on the load side of the service disconnecting means except as covered in 250.30(A) for separately derived systems, and 250.32(B) Exception No. 1 for separate buildings.

551.77 Recreational Vehicle Site Supply Equipment.

Recreational vehicle site supply equipment shall be listed for use as recreational vehicle site supply equipment and shall comply with 551.77(A) through (F).

(A) Location.

Where provided on back-in sites, the recreational vehicle site electrical supply equipment shall be located on the left (road) side of the parked vehicle, on a line that is 1.5 m to 2.1 m (5 ft to 7 ft) from the left edge (driver's side of the parked RV) of the stand and shall be located at any point on this line from the rear of the stand to 4.5 m (15 ft) forward of the rear of the stand.

For pull-through sites, the electrical supply equipment shall be permitted to be located at any point along the line that is 1.5 m to 2.1 m (5 ft to 7 ft) from the left edge (driver's side of the parked RV) from 4.9 m (16 ft) forward of the rear of the stand to the center point between the two roads that gives access to and egress from the pull-through sites.

The left edge (driver's side of the parked RV) of the stand shall be marked.

(B) Disconnecting Means.

A disconnecting switch or circuit breaker shall be provided in the site supply equipment for disconnecting the power supply to the recreational vehicle.

(C) Access.

All site supply equipment shall be accessible by an unobstructed entrance or passageway not less than 600 mm (2 ft) wide and 2.0 m (6 ft 6 in.) high.

(D) Mounting Height.

Site supply equipment shall be located not less than 600 mm (2 ft) above the electrical datum plane for that RV site and no more than 2.0 m (6 **1**/**2** ft) above the ground unless platform provisions are made to reach the circuit protection devices that are no more than 2.0 m (6 **1**/**2** ft) above that platform.

(E) Working Space.

Sufficient space shall be provided and maintained about all electrical equipment to permit ready and safe operation, in accordance with 110.26 .

(F) Marking.

Where the site supply equipment contains a 125/250-volt receptacle, the equipment shall be marked as follows: "Turn disconnecting switch or circuit breaker off before inserting or removing plug. Plug must be fully inserted or removed." The marking shall be located on the equipment adjacent to the receptacle outlet.

551.78 Protection of Outdoor Equipment.

(A) Wet Locations.

All switches, circuit breakers, receptacles, control equipment, and metering devices located in wet locations shall be weatherproof.

(B) Meters.

If secondary meters are installed, meter sockets without meters installed shall be blanked off with an approved blanking plate.

551.79 Clearance for Overhead Conductors.

Open conductors of not over 1000 volts, nominal, shall have a vertical clearance of not less than 5.5 m (18 ft) and a horizontal clearance of not less than 900 mm (3 ft) in all areas subject to recreational vehicle movement. In all other areas, clearances shall conform to 225.18 and 225.19 .

Informational Note: See 225.60 and 225.61 , for clearances of conductors over 600 volts, nominal.

551.80 Underground Service, Feeder, Branch-Circuit, and Recreational Vehicle Site Feeder-Circuit Conductors.

(A) General.

All direct-burial conductors, including the equipment grounding conductor if of aluminum, shall be insulated and identified for the use. All conductors shall be continuous from equipment to equipment. All splices and taps shall be made in approved junction boxes or by use of listed material.

(B) Protection Against Physical Damage.

Direct-buried conductors and cables entering or leaving a trench shall be protected by rigid metal conduit, intermediate metal conduit, electrical metallic tubing with supplementary corrosion protection, rigid polyvinyl chloride conduit (PVC), nonmetallic underground conduit with conductors (NUCC), high density polyethylene conduit (HDPE), reinforced thermosetting resin conduit (RTRC), liquidtight flexible nonmetallic conduit, liquidtight flexible metal conduit, or other approved raceways or enclosures. Where subject to physical damage, the conductors or cables shall be protected by rigid metal conduit, intermediate metal conduit, Schedule 80 PVC conduit, or RTRC listed for exposure to physical damage. All such protection shall extend at least 450 mm (18 in.) into the trench from finished grade.

Informational Note: See 300.5 and Article 340 for conductors or Type UF cable used underground or in direct burial in earth.

551.81 Receptacles.

A receptacle to supply electric power to a recreational vehicle shall be one of the configurations shown in Figure 551.46(C)(1) in the following ratings:

(1) 50-ampere — 125/250-volt, 50-ampere, 3-pole, 4-wire grounding type for 120/240-volt systems

(2) 30-ampere — 125-volt, 30-ampere, 2-pole, 3-wire grounding type for 120-volt systems

(3) 20-ampere — 125-volt, 20-ampere, 2-pole, 3-wire grounding type for 120-volt systems

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications* , Figures 14-50, TT, and 5-20, for complete details of these configurations.

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair, Dave Watson, (CMP 6) and Dean Hunter (CMP 7). The task group was assigned the following charge. The Correlating Committee notes that more than one related term is being used for “Power-Supply Cord.” Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. In addressing the multiple definitions for power supply cord, the task group identified a correlation issue relative to the use of the terms “Power-Supply Assembly” and “Feeder Assembly”.

The definition for “Power-Supply Assembly” is specific to Article 551, “Feeder Assembly” is a defined term used in Article 550, which is very similar to the term “Power-Supply Assembly” as used in Articles 551 and 552. To eliminate some correlation issues when using these two different terms within articles under CMP-7 purview, it would make sense to modify the existing definition for “Feeder Assembly” and exchange the term “Power-Supply Assembly” with “Feeder Assembly” where it is used in Articles 551 and 552. The task group is recommending to delete the definition for “Power-Supply Assembly”, and combine the definition for “Power-Supply Assembly” with “Feeder Assembly”. Additionally, term “Power-Supply Assembly” would be replaced with the term with “Feeder Assembly” where it is used in Articles 551 and 552.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]	Definition for a related term
Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]	Definition for a related term
Public Comment No. 1874-NFPA 70-2021 [Article 552]	Definition for a related term
Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]	
Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]	
Public Comment No. 1874-NFPA 70-2021 [Article 552]	

Related Item

• FR 9274 (Global Input)

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Public Comment No. 822-NFPA 70-2021 [Section No. 551.3]

551.3 Electrical Datum Plane Distances.

The electrical datum plane distance(s) is determined by the normal high water level and encompasses the areas subject to tidal movement and areas in which the water level is affected by the conditions such as climate (rain or snowfall) or by human intervention (the opening and closing of dams or floodgates). The distance does not consider extremes due to natural or manmade disasters.

(A) Areas Subject to Tidal Fluctuations.

In land areas subject to tidal fluctuation, the electrical datum plane shall be a horizontal plane that is 606 mm (2 ft) above the highest high tide level for the area occurring under normal circumstances.

(B) Areas Not Subject to Tidal Fluctuations.

In land areas not subject to tidal fluctuation, the electrical datum plane shall be a horizontal plane that is 606 mm (2 ft) above the normal high water level for the area occurring under normal circumstances.

Additional Proposed Changes

File Name	Description	Approved
7_CN_403_Detail.pdf	7 CN403	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 403 appeared in the First Draft Report on First Revision No. 7873.

The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the Style Manual. The Correlating Committee establishes a Task Group with representation from CMP-7 and 17 to address the terms "Electrical Datum Plane" and "Normal High Water Level" to consider the use of the terms and requirements for correlation.

Related Item

• First Revision No. 7873

Submitter Information Verification

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Committee: NEC-P07

Correlating Committee Note No. 403-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Fri May 07 17:16:29 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the Style Manual. The Correlating Committee establishes a Task Group with representation from CMP-7 and 17 to address the terms "Electrical Datum Plane" and “Normal High Water Level” to consider the use of the terms and requirements for correlation.

First Revision No. 7873-NFPA 70-2020 [Detail]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1239-NFPA 70-2021 [Section No. 551.20(E)]

(E) Autotransformers.

Autotransformers shall not be used.

1. This regulation must be eliminated.

2. **How and what** : There is no justification for banning the use of autotransformers in RV parks. Low voltages commonly occur in RV parks. This low voltage causes increased amperage draw because the vast majority of loads in the park are inductive loads, primarily air conditioners. These inductive "appliances" are designed to operate on 120 volts. The farther the voltage moves away from 120 the more amps are drawn. Inductive coils, motors, transformers, and electronics start over heating. Not only these internal items but the park infrastructure can over heat as well. The only solution to this ever present problem is to boost the voltage back to a safer level. This is exactly what the autotransformer does. The autotransformer reduces current flow by 10% to all inductive devices. With 10% more volts motors such as those in air conditioners gain 19% more torque. This translates into much greater air flow and way cooler coils! That translates into air conditioners cycling off way more often and that translates into way less load on the RV park infrastructure. This is only one example. All this is accomplished by drawing no more power from the park. Autoformers are simply boosting voltage and allowing inductive devices to draw less amps. It all occurs on the RV side of the autotransformer.

3. **The literature** : Any scientific article addressing low voltage and motors will bear these facts out. For an example please refer to a recent article in the September, 2020 issue of "RV News" (pg 24). Matthew Conville of EASA lays out all the science plus a chart of amperage vs. voltage curves.

4. **Science** : In light of the science, RV PARKS AND THE NFPA SHOULD BE ENCOURAGING THE USE OF AUTOTRANSFORMER VOLTAGE BOOSTING DEVICES.

5. **Safety** : If the NFPA's purpose is safety, autoformers reduce overheating and damage to an RVs internal electrical workings and consequently reduce overheating and damge to park infrastructure. This in turn makes everyone and everything SAFER in the RV park.

6. **Jurisdiction:** Does the NFPA have the authority to tell RV owners what appliances they can use? If the NFPA wants to reduce damage to RV park infrastructure, banning air conditioners would be far more effective. What about hair dryers, micro wave ovens, refrigerators? Since the autotransformer only reduces amperage, banning any of these other appliances a customer brings to an RV park would make far more sense. BANNING THE VOLTAGE BOOSTING AUTOTRANSFORMER, WHICH REDUCES OVERALL LOAD, MAKES NO SENSE. The autotransformer, a privately owned votage boosting safety appliance, often installed internally and permanently in the RV, is beyond the jurisdiction of the NFPA.

7. **Conclusion** : Banning the autotransformer was simply unjust and must be reversed. SCIENCE, REASON AND THE NFPA's OWN RULES dictate that this ban be removed. Further actions necessary to rectify this erronious ban would be regrettable.

Additional Proposed Changes

File Name	Description	Approved
Motor_Curves.png	The exponential loss of torque	
Motors_vs_Volts_RV_News.pdf		

Statement of Problem and Substantiation for Public Comment

The problem is the NFPA issued a ban on autotransformers. This ban must be removed as there is no scientific reason for doing so nor is there legal grounds to do so.

Related Item

- autotransformers

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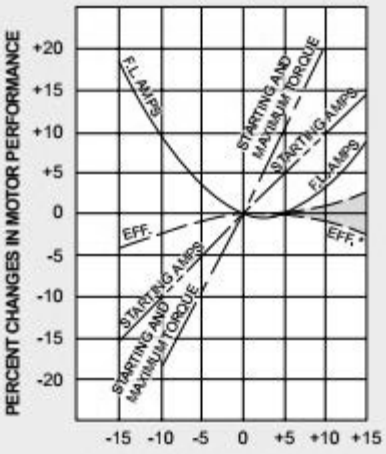
Committee: NEC-P07



* Note: Efficiency may increase or decrease depending upon motor design.

This chart shows a summary of the typical effects of high and low voltage on the performance of a motor. When rewinding a motor that you know does not match the customer s voltage supply, consider changing the design slightly to meet the exact voltage requirements. This will ensure that the motor will perform at its optimal level.

The Effects of High or Low Voltage on Motor Performance

Ever had a customer return from camping and complain of a distinct odor of burnt electronics filling the air? The next thing that RVer knows, the water pump quits and the AC stops working. The consumer flips the switch for a circulating fan, but nothing happens. Even the stabilizer jacks will not operate.

If so, the culprit may be voltage variation from the incoming power source, which sometimes is hundreds of feet from the distribution transformer that supplies the varying demands of all the RVs connected to it. While that prime campsite might be perfect for the user, voltage variation can be hazardous for the RV's electrical devices—especially its electric motors.

The National Electrical Manufacturers Association (NEMA) publishes industry standards for electric motors and generators that include specifications for voltage variation. According to its MG 1 standard, AC motors "shall operate successfully" at the rated load if the power source is within these parameters:

- Plus/minus 10 percent of rated voltage with rated frequency for induction motors.
- Plus/minus 6 percent of rated voltage with rated frequency for universal motors.
- 10 percent combined variation in rated voltage and frequency (sum of absolute values) if:
  - Frequency is within plus/minus 5 percent of rated frequency.
  - Voltage variation of universal motors (except fan motors) is within plus/minus 6 percent of rated voltage.

Frequency variation usually is not a problem in North America, where most RV electrical devices require 60 Hz rather than 50 Hz power. The allowable voltage variation is 6 to 10 percent, depending on the types of electric motors in the RV. These typically consist of AC induction, universal, DC and servo motors, as well as AC generators (alternators). Table 1 shows the voltage limits for 120 VAC and 230 VAC services for AC induction and universal motors.

Measuring the actual voltage at an RV hookup requires a digital multimeter (DMM). Consumer-grade DMMs are available from many reputable manufacturers, as is the required personal protective equipment (PPE). If in doubt, the user should ask maintenance personnel at the campsite to measure the hookup's voltage.

Table 1: Voltage variation limits for 120 VAC and 230 VAC services

120 VAC service		230 VAC service	
Nominal	120.0 VAC	Nominal	230.0 VAC
-6%	112.8 VAC	-6%	216.2 VAC
+6%	127.2 VAC	+6%	243.8 VAC
-10%	108.0 VAC	-10%	207.0 VAC
+10%	132.0 VAC	+10%	253.0 VAC

Voltage Calculation Examples

Let's suppose an RV has some universal motors, and the campground's 230 VAC electrical service measures 215 VAC at the hookup. Table 1 shows the minimum acceptable voltage is 216.2 VAC, which means the supplied voltage is too low at that hookup.

Now assume the RV does not have any universal motors, and the 120 VAC service measures 127 VAC at the hookup. According to Table 1, the allowable limit at +10 percent is 132 VAC, making this service acceptable.

High/Low Voltage Effects on Motor Performance and Reliability

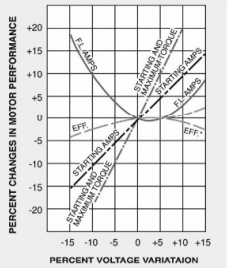
So, does operating within NEMA's parameters influence electric motor performance and reliability? The short answer is yes. Even though the NEMA Std. MG 1 standard says various motor designs will operate within 6 to 10 percent of rated voltage, that limit does not accurately reflect what happens when motors run on high or low voltage. Any change from the rated voltage and frequency will affect the motor's performance, sometimes dramatically.

The various electric motors in an RV may have different application-dependent magnetic flux characteristics, but the same principles still apply. For example, higher input voltage equals a higher magnetic flux. At some point, that will begin to saturate the motor's core, causing it to heat up quickly and potentially damaging the motor's insulation system.

A low voltage supply is more harmful than high voltage because it decreases the magnetic flux in the core iron. Not using the core iron optimally causes efficiency and torque to fall as the motor's internal temperature begins to rise. In this scenario, motors tend to become overloaded doing the same work as before and often fail prematurely. Figure 1 shows the typical effects of voltage variation on AC induction motors.

The following summary explains how over and under voltage typically affects induction motor performance.

- **Torque.** The torque of an induction motor varies as the square of the voltage, so any small variation in voltage will significantly affect the starting and maximum torque. At 110 percent voltage, torque will increase by 21 percent, but at 90 percent voltage, torque will decrease by 19 percent. This variation could pose a problem if the motor needs to start a high-inertia load.
- **Speed.** The speed will change slightly with high or low voltage, increasing about 1 percent at 110 percent voltage and decreasing about 1.5 percent at 90 percent voltage. But when you look at the speed change in percent slip, the numbers are more dramatic. Slip is the difference between the speed of the motor's rotating magnetic field (synchronous speed) and how fast its shaft is turning. At 110 percent voltage, slip will decrease 17 percent; at 90 percent voltage, it will increase 23 percent.
- **Energy efficiency.** At 110 percent voltage, a motor may be up to 1 percent more efficient than at its rated voltage. At 90 percent voltage, however, a motor is about 2 percent less efficient. This difference in efficiency is especially important for larger motors, potentially increasing operating costs significantly.
- **Current.** At 110 percent voltage, the starting current will increase 10 to 12 percent, but the full-load current will decrease 7 percent. This may cause a problem if the power supply cannot handle the higher starting current. At 90 percent voltage, the starting current will decrease 10 to 12 percent, while the full-load current will increase 11 percent.
- **Temperature rise.** Variations in voltage also affect the temperature rise at full load. At 110 percent voltage, a motor will have a 21 percent higher overload capacity; at 90 percent voltage, that capacity will decrease by 19 percent. Motors often run overloaded for some period, so operating on under-voltage increases the possibility of premature failure.



* **Note:** Efficiency may increase or decrease depending upon motor design.

This graph summarizes the typical effects of high and low voltage on electric motor performance.

Checking Service Voltage Is Critical

To ensure the reliability of an RV's electrical devices, especially electric motors, campers must know the service voltage of the hookup their RV is using. Teaching consumers to check that before they plug in the vehicle could save them many headaches.

Although NEMA Std. MG 1 allows up to plus/minus 10 percent voltage variation for certain electric motors, performance and reliability may suffer if the service voltage is lower than the motor's nameplate rating. Once your customers find that perfect RV campsite, have them check the voltage at the service box with a DMM and PPE before plugging in. This is a great opportunity to sell those devices in your retail store as well. 698

Matthew Conville
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Public Comment No. 162-NFPA 70-2021 [New Section after 551.30(E)]

(F) Portable Generator

If the recreational vehicle is supplied by a portable generator, the neutral or grounded system conductor shall be connected to the frame of the generator to ensure that a ground-fault return path is provided.

Statement of Problem and Substantiation for Public Comment

The Panel Statement that "RV's are not constructed in this manner, see 551.30(A)" is a little confusing. The intention of PI-4469 and this Comment is to ensure that if the RV is supplied from a portable or vehicle mounted generator, the neutral is bonded to the generator frame where the equipment grounding conductor is connected. This neutral-to-ground connection ensures that a ground-fault return path is present.

Note that the term "vehicle-mounted" was added to 250.34 because portable generators are commonly mounted on vehicles or trailers as well as being free-standing.

The addition of this requirement is critically important. Several manufacturers produce and sell portable or vehicle-mounted generators that have a 30-amp, 125-volt receptacle that is identified for recreational vehicle use and yet the neutral is identified as "floating:. As a result, a ground-fault return path is not established.

Ground-fault circuit interrupters cannot function. (Note that a GFCI receptacle will function when the "Test" button is pushed but that tests only the internal operation of the GFCI receptacle. A ground-fault return path does not exist if the neutral of the portable or vehicle-mounted generator is floating.)

Without the bonding of the neutral at the generator, a ground-fault return path does not exist from grounding-type receptacles or for equipment.

CMP-7 has added a requirement in 551.40(D) for a device to detect the absence of an equipment grounding conductor in the supply to the RV. If the RV is supplied by a portable generator that has a floating neutral, it will no doubt sound an alarm continuously!

Related Item

- PI-4469

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Public Comment No. 161-NFPA 70-2021 [Section No. 551.40(D)]

(D) Loss of Equipment Ground Device.

A device ~~listed~~ to indicate the loss or absence of an effective equipment ground fault path shall be installed directly adjacent to the recreational vehicle entrance so that the external indicator display is visible prior to entry into the recreational vehicle. The device shall be listed.

The device shall provide a continuous visible or audible signal response to the loss or absence of an equipment ground fault path .

Statement of Problem and Substantiation for Public Comment

The presence of an effective ground-fault path is of utmost importance for safety. It must be monitored for effective safety. The mere presence of a "ground" could be satisfied by a ground rod at the unit. This could represent an earth return which is not allowed by 250.4(A)(5). The correct term is "equipment ground" or equipment grounding conductor" as is provided in this Comment. Also, see the definition of "Effective Ground-Fault Current Path" in Article 100.
The device should not be referred to as "listed to indicate" anything. The device needs to be listed to comply with a safety standard. It is also critically important that the device indicate the absence of an equipment grounding conductor as much as the loss of one. Suppose an equipment grounding conductor is not present when the RV first is connected at the site rather than it is lost some time after arrival and connection.

Related Item

• FR-7851

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Public Comment No. 65-NFPA 70-2021 [Section No. 551.40(D)]

~~(D) Loss of Ground Device.~~

~~A device listed to indicate loss of ground shall be installed directly adjacent to the recreational vehicle entrance so that the external indicator display is visible prior to entry into the recreational vehicle.~~

~~The device shall provide a continuous visible or audible signal response to the loss of ground.~~

Statement of Problem and Substantiation for Public Comment

As designed and built from the manufacturer, RV's must comply with the latest NEC electrical codes and are safe for the consumer.
During the production process RV's are required by the NEC to have a polarity test that would negate the possibility of an open ground. The majority of shocks caused by hot skin are non-RV specific failures.
These failures in fact are almost always the cause of what and where the RV power cord is plugged into. These outlets or pedestals that the power cord is plugged into are usually wired incorrectly causing the possibility of hot skin. To confirm that this a non-RV specific problem our two largest manufacturers looked back through ten years of warranty, recalls and litigation and found no information on hot skin. This research would include well over two million RV's.
As written the revision would not provide absolute safety, If the RV owner is plugging into the incorrectly wired outlet or pedestal causing the skin to become energized and someone may be touching the chassis, they would never see the visible signal on the opposite side of the RV. This requirement should not be placed on the RV to perform.

Related Item

• FR-7851

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Public Comment No. 701-NFPA 70-2021 [Section No. 551.40(D)]

~~loss of ground.~~

(D) ~~Loss of Ground Device.~~

~~A device listed to indicate loss of ground shall be installed directly adjacent to the recreational vehicle entrance so that the external indicator display is visible prior to entry into the recreational vehicle.~~

~~The device shall provide a continuous visible or audible signal response to the~~

Grounding Monitor Interrupter

Each recreational vehicle shall be provided with a listed grounding monitor interrupter permanently connected between the power supply assembly connection to the vehicle and the panelboard.

Statement of Problem and Substantiation for Public Comment

The loss of ground to a recreational vehicle (RV) can result in a "hot skin" condition creating an electric shock hazard. CMP 7 has previously determined a GFCI on the input (feeder) of an RV is not practical due to additive leakage current present on an entire RV supply. RV's are typically connected to RV site supply equipment by a separable power supply cord assembly. These power supply cord assemblies are exposed to extensive physical abuse such as laying on the ground during use where they may be run over by vehicles, other equipment or humans unknowingly damaging the grounding conductor internal to the power supply cord or damaging the grounding pin on the plug during use or storage. For these reasons the power supply cord may not provide a reliable ground path. Regardless if there is a loss of ground in the power supply cord or the connection to ground in the RV site supply equipment, a grounding monitor interrupter will detect the loss of ground to the RV and open the supply circuit to the RV. If a grounding monitor interrupter is required, then the "loss of ground indicator" added at the first draft meeting is no longer necessary. This protection is an improvement over the "loss of ground indicator" as it not only detects the loss of ground, but interrupts the faulty circuit.

Grounding monitor interrupter circuits are used as part of the personnel protection system referenced in NEC 625.22 for electric vehicles and required in Listed electrical vehicle supply equipment (EVSE). Requirements are provided in ANSI/UL 2231-1, "Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: General Requirements," and ANSI/UL 2231-2, "Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems." As Certification/Listing requirements already exist for grounding monitor interrupter circuits for EVSE, development of a standard specifically for grounding monitor interrupters for this use can be expeditious.

Related Item

• PI 1990

Submitter Information Verification

Submitter Full Name: Thomas Lichtenstein
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 03 11:45:21 EDT 2021
Committee: NEC-P07

Public Comment No. 1960-NFPA 70-2021 [Section No. 551.47(A)]

(A) Wiring Systems.

Cables and raceways installed in accordance with Articles 320, 322, 330 through 340, 342 through 362, 386, and 388 shall be permitted in accordance with their applicable article, except as otherwise specified in this article. An equipment grounding means shall be provided in accordance with 250.118.

Additional Proposed Changes

File Name	Description	Approved
CN_335.pdf	70_CN335	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No.335 appeared in the First Draft Report.

The Correlating Committee directs the panel to revise the requirement to remove the references to entire articles in accordance with 4.1.4 of the NEC Style Manual.

Related Item

• Correlating Note No. 335

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:35:36 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 335-NFPA 70-2021 [Section No. 551.47(A)]

Submitter Information Verification

Committee: NEC-AAC
Submittal Date: Thu May 06 16:31:52 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to revise the requirement to remove the references to entire articles in accordance with 4.1.4 of the NEC Style Manual.

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 794-NFPA 70-2021 [Section No. 551.47(L)]

(L) Receptacle Faceplates.

Metal faceplates shall comply with 406.6(A). Nonmetallic faceplates shall comply with 406.6(C).

Additional Proposed Changes

File Name	Description	Approved
7_CN_328.pdf	7 CN328	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 328 appeared in the First Draft Report on First Revision No. 7876.

The Correlating Committee directs the Panel to review references to 406.6 for compliance with NEC 90.3 and Section 4.1.1 of the Style Manual. The requirement repeats general faceplate requirements from Article 406.

Related Item

• First Revision No. 7876

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:50:22 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 328-NFPA 70-2021 [Section No. 551.47(L)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:08:57 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to review references to 406.6 for compliance with NEC 90.3 and Section 4.1.1 of the Style Manual. The requirement repeats general faceplate requirements from Article 406.

First Revision No. 7876-NFPA 70-2020 [Section No. 551.47(L)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 75-NFPA 70-2021 [Section No. 551.47(N)]

(N) Moisture or Physical Damage.

Where outdoor or under-chassis line-voltage (120 volts, nominal, or higher) wiring is exposed to moisture or physical damage, it shall be protected by a conduit or raceway identified for use in wet locations and be closely routed against frames and equipment enclosures or other raceway or cable identified for the application. ~~The conductors shall be listed for use in wet locations.~~

Statement of Problem and Substantiation for Public Comment

Comments: First Revision No. 7877-

Last sentence should be struck. When wiring is installed in conduit or raceway identified for use in wet locations then the conductors should not be required to be listed for use in wet locations. If you chose to install wiring in wet locations, it's already covered in the second to last sentence; or cable identified for the application.

Related Item

• FR-7877

Submitter Information Verification

Submitter Full Name: Curt Richardson
Organization: Recreation Vehicle Industry As
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 01 14:43:21 EDT 2021
Committee: NEC-P07

Public Comment No. 1716-NFPA 70-2021 [Section No. 551.54(C)]

(C) Insulated Grounded Conductor (Neutral Conductor) .

The grounded circuit conductor (neutral conductor) shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts. The grounded circuit conductor (neutral conductor) terminals in the panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps, or buses in the panelboard or in appliances shall be removed and discarded. Connection of electric ranges and electric clothes dryers utilizing a grounded conductor, if cord-connected, shall be made with 4-conductor cord and 3-pole, 4-wire grounding-type plug caps and receptacles.

Statement of Problem and Substantiation for Public Comment

The proper and correct term to use here is "grounded" circuit conductor. We are talking about the intentionally grounded conductor here. In an RV, it is also the neutral conductor. It was inappropriate (and unnecessary) to remove the term "grounded" circuit conductor here. This tern (grounded conductor) alliins with its most common use in Article 250.

Related Item

• FR 7879 • PI 1373

Submitter Information Verification

Submitter Full Name: L. Keith Lofland
Organization: IAEI
Affiliation: None
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 13:56:06 EDT 2021
Committee: NEC-P07

Public Comment No. 1131-NFPA 70-2021 [Section No. 551.71(C)]

(C) 50-Ampere.

A minimum of 20 percent of existing and 40 percent of all new recreational vehicle sites, with electrical supply, shall each be equipped with a 50-ampere, 125/250-volt weather-resistant receptacle conforming to the configuration as identified in Figure 551.46(C)(1). Every recreational vehicle site equipped with a 50-ampere receptacle shall also be equipped with a 30-ampere, 125-volt receptacle conforming to Figure 551.46(C)(1). These electrical supplies shall be permitted to include additional receptacles that have configurations in accordance with 551.81.

Informational Note: The percentage of 50 ampere sites required by 551.71 could be inadequate for seasonal recreational vehicle sites serving a higher percentage of recreational vehicles with 50-ampere electrical systems. In that type of recreational vehicle park, the percentage of 50-ampere sites could approach 100 percent.

Statement of Problem and Substantiation for Public Comment

Resolution: FR-7880-NFPA 70-2020
In response to the committee's statement of accepting part B for the WR 30 ampere while rejecting part C for the WR 50 ampere due to "unknown unavailability", I would like to make members aware that both ampacities and configurations had been commercially available since early 2021 and are UL listed to UL's 498 WR requirements. I hope this information help you with your reassessment for the WR 50 ampere device.

Related Item

• FR-7880-NFPA 70-2020

Submitter Information Verification

Submitter Full Name: James Lowe
Organization: Leviton Manufacturing Company
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 10 07:06:06 EDT 2021
Committee: NEC-P07

Public Comment No. 1550-NFPA 70-2021 [Section No. 551.71(F)]

(F) GFCI Protection.

Ground-fault circuit-interrupter protection shall be provided as required in 210.8(B). ~~GFCI protection shall not be required for other than 125-volt, 15- and 20-ampere receptacles used in the recreational vehicle site equipment.~~

~~Informational Note No. 1: Appliances used within the recreational vehicle can create leakage current levels at the supply receptacle(s) that could exceed the limits of a Class A GFCI device.~~

~~Informational Note No. 2: The definition of *Power-Supply Assembly* in 551.2 and the definition of *Feeder* in Article 100 clarifies that the power supply cord to a recreational vehicle is considered a feeder.~~

Statement of Problem and Substantiation for Public Comment

The committee was informed of the danger and a death related to hot skin condition through PI 2566-NFPA 70-2017 and PC 1761-NFPA 70-2018 during the 2020 cycle. The committee accepted that hot skin condition was a problem. At that time, the solution to this problem was to require that reverse polarity monitors be installed in RVs, while rejecting proposals to implement GFCI protection for all receptacles at the pedestal.

During the 2023 cycle PI 1990-NFPA 70-2020 was submitted that proposed requiring a ground monitoring device in addition to the reverse polarity monitor to combat hot skin condition. The committee determined that their previous decision from the 2020 cycle should be reversed and deleted the requirement for the reverse polarity device. The committee determined that a ground monitoring device should be installed in RVs to combat the hot skin condition. The request to add GFCI requirements to all receptacles on the pedestal was rejected.
The committee has also argued against both solutions that it has chosen to combat hot skin condition, by stating in FR 7849-NFPA 70-2020 "Including this requirement into the RV electrical system to be detected after the connection is made to the receptacle is too late…" in reference to the reverse polarity monitor. The ground monitoring device that was added in FR 7851-NFPA 70-2020 works on the same principle of detecting a problem, in this case, no ground, and then alerting of the condition after the connection is made.

Furthermore, the requirement from FR 7851-NFPA 70-2020 states that the indicator be "… installed directly adjacent to the recreational vehicle entrance so that the external indicator display is visible prior to entry into the recreational vehicle." This ignores that the danger will not only be located at the entrance of the RV, the entire exterior surface of the vehicle may become energized and would pose a danger to anyone in the immediate vicinity. See the substantiation from PC 1430-NFPA 70-2018 for a detailed explanation of the large exposed area that could be a hazard. Also, a visual indication on the exterior of the RV could be ignored and not acted upon, allowing the hazard to remain.

PI 1967-NFPA 70-2020 was also submitted to require GFCI protection for all receptacles at RV pedestals to comply with Article 625 due to the increased prevalence of EVs and the convenience provided by RV pedestals to EV drivers.

Over the last two cycles the committee's comments against GFCIs have been

- Nuisance tripping
- Definitions: Receptacles at pedestal are feeders
- Protection provided elsewhere: GFCI is provided inside of the RV
- Misuse: EV charging is not an intended use

Nuisance tripping

The purpose of the NEC is stated in 90.1 as "…the practical safeguarding of persons and property from the hazards arising from the use of electricity." To comply with the purpose of the NEC, safety must win when a choice must be made between safety and convenience.

Nuisance tripping is an issue of convenience. Hot skin condition and the dangers related to outdoor, publicly accessible receptacles are safety issues that arise from the use of electricity.

Definitions

It is clear that the power supply assembly for an RV and the receptacle to which it is attached is a feeder because the final OCPDs are located inside of the RV, and the power supply assembly is situated between the power supply source and the final OCPDs.

Each receptacle on an RV pedestal that has no RV attached is an outlet of a branch circuit (see discussion on misuse below). This is the only conclusion that can be reached because the conductors supplying the receptacle are situated between the final OCPD protecting the circuit and the outlet, meeting the definition of "branch circuit" in article 100.

The notion that GFCI protection is not required for RV pedestal receptacles because they are part of the feeder neglects to recognize that an RV must be connected for the receptacle to qualify as a feeder. Furthermore, if there is more than one receptacle on a pedestal, even when an RV is connected, all of the remaining receptacles are outlets of branch circuits. The receptacles are likely easily accessible and free to use by anyone in the vicinity.

Protection Provided Elsewhere

There are GFCI requirements that apply to the inside of RVs. These requirements are similar to those that are found in 210.8 and protection is required in areas where water and electricity are likely to be present together.

These requirements are intended to provide protection for persons in the locations where they are required, unfortunately, not for people that may be harmed by hot skin condition. If the hot skin condition is caused by a fault that occurs on the load side of a GFCI, the GFCI will provide protection. If the fault occurs in any other location, such as the line side of a GFCI receptacle, at the panel, or through damage to the power supply assembly, no protection will be provided.

Looking to 210.8, it is clear that exceptions to the GFCI requirements are acceptable, as long as there is some level deterrence to misuse employed. As an example, the exception to 210.8(A)(3) requires that in addition to the intended use, the receptacle is not readily accessible. As another example, the exception to 210.8(A)(5) requires that the receptacle supply a permanently installed alarm system. Permanently installed alarm systems are generally affixed to the receptacle with a screw and a tool is required for removal of the plug. In the case of RV pedestals, there are no means required to deter misuse, receptacles are standard and readily accessible from the parking area. To unqualified persons, there is no reason to think that charging an electric vehicle or utilizing a receptacle for any other purpose is considered misuse if their plug fits. Any misuse that a reasonable unqualified person may consider as an appropriate use should be considered a foreseeable misuse. GFCI protection for outdoor receptacles should be required for both intended uses and foreseeable misuses.

Related Item

• PI 1967

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 13:24:43 EDT 2021
Committee: NEC-P07

Public Comment No. 1915-NFPA 70-2021 [Section No. 551.71(F)]

(F) GFCI Protection.

Ground-fault circuit-interrupter protection shall be provided ~~as required in~~ 210.8(B) ~~. GFCI protection shall not be required for other than~~ for all 125-volt, 15- and 20-ampere receptacle outlets at an RV site. GFCI protection shall not be required for receptacles with higher voltage or current ratings used in the recreational vehicle site equipment.

Informational Note No. 1: Appliances used within the recreational vehicle can create leakage current levels at the supply receptacle(s) that could exceed the limits of a Class A GFCI device.

Informational Note No. 2: The definition of *Power-Supply Assembly* in 551.2 and the definition of *Feeder* in Article 100 ~~clarifies that~~ supports the classificatiuon of the power supply cord to a recreational vehicle ~~is considered~~ as a feeder.

Statement of Problem and Substantiation for Public Comment

The panel response to PI-4195 is not responsive. This comment makes editorial improvements in the TIA text that is now in effect. The major issue is that the text says first, GFCI must comply with 210.8(B). And then, the text says 210.8(B) does not apply. This text is much more cleanly rendered.

Related Item

• PI-4195

Submitter Information Verification

Submitter Full Name: Frederic Hartwell
Organization: Hartwell Electrical Services, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 15:59:14 EDT 2021
Committee: NEC-P07

Public Comment No. 1921-NFPA 70-2021 [Section No. 551.72(C)]

(C) Receptacles.

Receptacles rated at 50 amperes shall be supplied from ~~a branch~~ a circuit of the voltage class and rating of the receptacle. Other recreational vehicle sites with 125-volt, 20- and 30-ampere receptacles shall be permitted to be derived from any grounded distribution system that supplies 120-volt, single-phase power.

Statement of Problem and Substantiation for Public Comment

The panel statement said there was a clarification that this is addressing a feeder and not a branch circuit, but that clarification is not in evidence in the first draft text.

Related Item

• PI-4199 • FR-8168

Submitter Information Verification

Submitter Full Name: Frederic Hartwell
Organization: Hartwell Electrical Services, Inc.
Street Address:
City:
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Zip:
Submittal Date: Wed Aug 18 16:21:52 EDT 2021
Committee: NEC-P07

Public Comment No. 796-NFPA 70-2021 [Sections 551.72(C), 551.72(D)]

Sections 551.72(C), 551.72(D)

(C) Receptacles.

Receptacles rated at 50 amperes shall be supplied from a branch circuit of the voltage class and rating of the receptacle. Other recreational vehicle sites with 125-volt, 20- and 30-ampere receptacles shall be permitted to be derived from any grounded distribution system that supplies 120-volt, single-phase power.

(D) Neutral Conductors.

Neutral conductors shall be permitted to be reduced in size below the minimum required size of the ungrounded conductors for 240-volt, line-to-line, permanently connected loads only. The neutral conductors shall not be reduced in size below the size of the ungrounded conductors for the site distribution.

Informational Note No. 1: All loads in a recreational vehicle are 120-volt, line-to-neutral and are nonpermanently connected loads.

Informational Note No. 2: Due to the long circuit lengths typical in most recreational vehicle parks, feeder conductor sizes found in the ampacity tables of Article 310 may be inadequate to maintain the voltage regulation suggested in 215.2(A)(1) Informational Note No. 2. Total circuit voltage drop is a sum of the voltage drops of each serial circuit segment, where the load for each segment is calculated using the load that segment sees and the demand factors shown in Table 551.73(A).

Additional Proposed Changes

File Name	Description	Approved
7_CN_329.pdf	7 CN329	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No.329 appeared in the First Draft Report on First Revision No. 8168.

The Correlating Committee directs the Panel to revise Informational Note No. 1 in NEC 551.72(0) to comply with Section 3.1.3 of the NEC Style Manual. Informational Notes are not permitted to have mandatory language, requirements or make interpretations.

Related Item

• First Revision No. 8168

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:52:45 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 329-NFPA 70-2021 [Sections 551.72(C), 551.72(D)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:11:04 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to revise Informational Note No. 1 in NEC 551.72(D) to comply with Section 3.1.3 of the NEC Style Manual. Informational Notes are not permitted to have mandatory language, requirements or make interpretations.

First Revision No. 8168-NFPA 70-2020 [Sections 551.72(C), 551.72(D)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 645-NFPA 70-2021 [Section No. 551.72(E)]

~~**(E)** Connected Devices.~~

~~The use of autotransformers shall not be permitted. The use of listed surge protective devices shall be permitted.~~

Statement of Problem and Substantiation for Public Comment

551.72(E) should be deleted as the requirement is intended limit specific cord and plug connected devices and equipment connected to the distribution system and is not enforceable. The NEC cannot control the types of products that can be plugged into a receptacle outlet provided the device or equipment is provided with the appropriate configuration plug corresponding to the receptacle outlet. If an RV park wants to restrict specific equipment from connection to the RV park distribution system, that should be addressed in the rules at the RV park and does not belong in the NEC.

Related Item

• PI 690

Submitter Information Verification

Submitter Full Name: Thomas Lichtenstein
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 02 19:39:30 EDT 2021
Committee: NEC-P07

Public Comment No. 1874-NFPA 70-2021 [Article 552]

Article 552 Park Trailers

Replace all uses of "Power-Supply Assembly" in this Article with "Feeder Assembly."

Part I. General

552.1 Scope.

The provisions of this article cover the electrical conductors and equipment installed within or on park trailers not covered fully under Articles 550 and 551.

552.4 General Requirements.

A park trailer as specified in 552.2 is intended for seasonal use. It is not intended as a permanent dwelling unit or for commercial uses such as banks, clinics, offices, or similar. Units designed for such purposes are classified as relocatable structures and are covered in Part II of Article 545.

552.5 Labels.

Labels required by Article 552 shall be made of etched, metal-stamped, or embossed brass or stainless steel; plastic laminates not less than 0.13 mm (0.005 in.) thick; or anodized or alclad aluminum not less than 0.5 mm (0.020 in.) thick or the equivalent.

Informational Note: For guidance on other label criteria used in the park trailer industry, refer to ANSI Z535.4-2011, *Product Safety Signs and Labels*.

Part II. Low-Voltage Systems

552.10 Low-Voltage Systems.

(A) Low-Voltage Circuits.

Low-voltage circuits furnished and installed by the park trailer manufacturer, other than those related to braking, shall be subject to this *Code*. Circuits supplying lights subject to federal or state regulations shall comply with applicable government regulations and this *Code*.

(B) Low-Voltage Wiring.

(1) Material.

Copper conductors shall be used for low-voltage circuits.

Exception: A metal chassis or frame shall be permitted as the return path to the source of supply.

(2) Conductor Types.

Conductors shall conform to the requirements for Type GXL, HDT, SGT, SGR, or Type SXL or shall have insulation in accordance with Table 310.4(1) or the equivalent. Conductor sizes 6 AWG through 18 AWG or SAE shall be listed. Single-wire, low-voltage conductors shall be of the stranded type.

Informational Note: See SAE J1128-2015, *Low Voltage Primary Cable,* for Types GXL, HDT, and SXL, and SAE J1127-2015, *Low Voltage Battery Cable,* for Types SGT and SGR.

(3) Marking.

All insulated low-voltage conductors shall be surface marked at intervals not greater than 1.2 m (4 ft) as follows:

(1) Listed conductors shall be marked as required by the listing agency.

(2) SAE conductors shall be marked with the name or logo of the manufacturer, specification designation, and wire gauge.

(3) Other conductors shall be marked with the name or logo of the manufacturer, temperature rating, wire gauge, conductor material, and insulation thickness.

(C) Low-Voltage Wiring Methods.

(1) Physical Protection.

Conductors shall be protected against physical damage and shall be secured. Where insulated conductors are clamped to the structure, the conductor insulation shall be supplemented by an additional wrap or layer of equivalent material, except that jacketed cables shall not be required to be so protected. Wiring shall be routed away from sharp edges, moving parts, or heat sources.

(2) Splices.

Conductors shall be spliced or joined with splicing devices that provide a secure connection or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be spliced or joined to be mechanically and electrically secure without solder, and then soldered. All splices, joints, and free ends of conductors shall be covered with an insulation equivalent to that on the conductors.

(3) Separation.

Battery and other low-voltage circuits shall be physically separated by at least a 13-mm (½-in.) gap or other approved means from circuits of a different power source. Acceptable methods shall be by clamping, routing, or equivalent means that ensure permanent total separation. Where circuits of different power sources cross, the external jacket of the nonmetallic-sheathed cables shall be deemed adequate separation.

(4) Ground Connections.

Ground connections to the chassis or frame shall be made in an accessible location and shall be mechanically secure. Ground connections shall be by means of copper conductors and copper or copper-alloy terminals of the solderless type identified for the size of wire used. The surface on which ground terminals make contact shall be cleaned and be free from oxide or paint or shall be electrically connected through the use of a cadmium, tin, or zinc-plated internal/external-toothed lockwasher or locking terminals. Ground terminal attaching screws, rivets or bolts, nuts, and lockwashers shall be cadmium, tin, or zinc-plated except rivets shall be permitted to be unanodized aluminum where attaching to aluminum structures.

The chassis-grounding terminal of the battery shall be connected to the unit chassis with a minimum 8 AWG copper conductor. In the event the unbonded lead from the battery exceeds 8 AWG, the bonding conductor size shall be not less than that of the unbonded lead.

(D) Battery Installations.

Storage batteries subject to this *Code* shall be securely attached to the unit and installed in an area vaportight to the interior and ventilated directly to the exterior of the unit. Where batteries are installed in a compartment, the compartment shall be ventilated with openings having a minimum area of 1100 mm^2 (1.7 $in.^2$) at both the top and at the bottom. Where compartment doors are equipped for ventilation, the openings shall be within 50 mm (2 in.) of the top and bottom. Batteries shall not be installed in a compartment containing spark- or flame-producing equipment.

(E) Overcurrent Protection.

(1) Rating.

Low-voltage circuit wiring shall be protected by overcurrent protective devices rated not in excess of the ampacity of copper conductors, in accordance with Table 552.10(E)(1).

Table 552.10(E)(1) Low-Voltage Overcurrent Protection

Wire Size (AWG)	Ampacity	Wire Type
18	6	Stranded only
16	8	Stranded only
14	15	Stranded or solid
12	20	Stranded or solid
10	30	Stranded or solid

(2) Type.

Circuit breakers or fuses shall be of an approved type, including automotive types. Fuseholders shall be clearly marked with maximum fuse size and shall be protected against shorting and physical damage by a cover or equivalent means.

> Informational Note: For further information, see ANSI/SAE J554-1987, *Standard for Electric Fuses (Cartridge Type)*; SAE J1284-1988, *Standard for Blade Type Electric Fuses*; and UL 275-2005, *Standard for Automotive Glass Tube Fuses*.

(3) Appliances.

Appliances such as pumps, compressors, heater blowers, and similar motor-driven appliances shall be installed in accordance with the manufacturer's instructions.

Motors that are controlled by automatic switching or by latching-type manual switches shall be protected in accordance with 430.32(B).

(4) Location.

The overcurrent protective device shall be installed in an accessible location on the unit within 450 mm (18 in.) of the point where the power supply connects to the unit circuits. If located outside the park trailer, the device shall be protected against weather and physical damage.

Exception: External low-voltage supply shall be permitted to have the overcurrent protective device within 450 mm (18 in.) after entering the unit or after leaving a metal raceway.

(F) Switches.

Switches shall have a dc rating not less than the connected load.

(G) Luminaires.

All low-voltage interior luminaires rated more than 4 watts, employing lamps rated more than 1.2 watts, shall be listed.

Part III. Combination Electrical Systems

552.20 Combination Electrical Systems.

(A) General.

Unit wiring suitable for connection to a battery or other low-voltage supply source shall be permitted to be connected to a 120-volt source, provided that the entire wiring system and equipment are rated and installed in full conformity with Parts I, III, IV, and V requirements of this article covering 120-volt electrical systems. Circuits fed from ac transformers shall not supply dc appliances.

(B) Voltage Converters (120-Volt Alternating Current to Low-Voltage Direct Current).

The 120-volt ac side of the voltage converter shall be wired in full conformity with the requirements of Parts I and IV of this article for 120-volt electrical systems.

Exception: Converters supplied as an integral part of a listed appliance shall not be subject to 552.20(B).

All converters and transformers shall be listed for use in recreation units and designed or equipped to provide over-temperature protection. To determine the converter rating, the following percentages shall be applied to the total connected load, including average battery-charging rate, of all 12-volt equipment:

The first 20 amperes of load at 100 percent plus

The second 20 amperes of load at 50 percent plus

All load above 40 amperes at 25 percent

Exception: A low-voltage appliance that is controlled by a momentary switch (normally open) that has no means for holding in the closed position shall not be considered as a connected load when determining the required converter rating. Momentarily energized appliances shall be limited to those used to prepare the unit for occupancy or travel.

(C) Bonding Voltage Converter Enclosures.

The non–current-carrying metal enclosure of the voltage converter shall be connected to the frame of the unit with an 8 AWG copper conductor minimum. The equipment grounding conductor for the battery and the metal enclosure shall be permitted to be the same conductor.

(D) Dual-Voltage Fixtures Including Luminaires or Appliances.

Fixtures, including luminaires, or appliances having both 120-volt and low-voltage connections shall be listed for dual voltage.

(E) Autotransformers.

Autotransformers shall not be used.

(F) Receptacles and Plug Caps.

Where a park trailer is equipped with a 120-volt or 120/240-volt ac system, a low-voltage system, or both, receptacles and plug caps of the low-voltage system shall differ in configuration from those of the 120-volt or 120/240-volt system. Where a unit equipped with a battery or dc system has an external connection for low-voltage power, the connector shall have a configuration that will not accept 120-volt power.

Part IV. Nominal 120-Volt or 120/240-Volt Systems

552.40 120-Volt or 120/240-Volt, Nominal, Systems.

(A) General Requirements.

The electrical equipment and material of park trailers indicated for connection to a wiring system rated 120 volts, nominal, 2-wire with an equipment grounding conductor, or a wiring system rated 120/240 volts, nominal, 3-wire with an equipment grounding conductor, shall be listed and installed in accordance with Parts I, III, IV, and V of this article.

(B) Materials and Equipment.

Electrical materials, devices, appliances, fittings, and other equipment installed, intended for use in, or attached to the park trailer shall be listed. All products shall be used only in the manner in which they have been tested and found suitable for the intended use.

552.41 Receptacle Outlets Required.

(A) Spacing.

Receptacle outlets shall be installed at wall spaces 600 mm (2 ft) wide or more so that no point along the floor line is more than 1.8 m (6 ft), measured horizontally, from an outlet in that space.

Exception No. 1: Bath and hallway areas shall be exempt from outlet spacing requirements.

Exception No. 2: Wall spaces occupied by kitchen cabinets, wardrobe cabinets, built-in furniture; behind doors that may open fully against a wall surface; or similar facilities.

(B) Location.

Receptacle outlets shall be installed as follows:

(1) Adjacent to countertops in the kitchen [at least one on each side of the sink if countertops are on each side and are 300 mm (12 in.) or over in width and depth]

(2) Adjacent to the refrigerator and gas range space, except where a gas-fired refrigerator or cooking appliance, requiring no external electrical connection, is factory-installed

(3) Adjacent to countertop spaces of 300 mm (12 in.) or more in width and depth that cannot be reached from a receptacle required in 552.41(B)(1) by a cord of 1.8 m (6 ft) without crossing a traffic area, cooking appliance, or sink

(C) Ground-Fault Circuit-Interrupter Protection.

Each 125-volt, single-phase, 15- or 20-ampere receptacle shall have ground-fault circuit-interrupter protection for personnel in the following locations:

(1) Where the receptacles are installed to serve kitchen countertop surfaces

(2) Within 1.8 m (6 ft) of any lavatory or sink

Exception: Receptacles installed for appliances in dedicated spaces, such as for dishwashers, disposals, refrigerators, freezers, and laundry equipment.

(3) In the area occupied by a toilet, shower, tub, or any combination thereof

(4) On the exterior of the unit

Exception: Receptacles that are located inside of an access panel that is installed on the exterior of the unit to supply power for an installed appliance shall not be required to have ground-fault circuit-interrupter protection.

The receptacle outlet shall be permitted in a listed luminaire. A receptacle outlet shall not be installed in a tub or combination tub–shower compartment.

(D) Pipe Heating Cable Outlet.

Where a pipe heating cable outlet is installed, the outlet shall be as follows:

(1) Located within 600 mm (2 ft) of the cold water inlet

(2) Connected to an interior branch circuit, other than a small-appliance branch circuit

(3) On a circuit where all of the outlets are on the load side of the ground-fault circuit-interrupter protection for personnel

(4) Mounted on the underside of the park trailer and shall not be considered to be the outdoor receptacle outlet required in 552.41(E)

(E) Outdoor Receptacle Outlets.

At least one receptacle outlet shall be installed outdoors. A receptacle outlet located in a compartment accessible from the outside of the park trailer shall be considered an outdoor receptacle. Outdoor receptacle outlets shall be protected as required in 552.41(C)(4).

(F) Receptacle Outlets Not Permitted.

(1) Shower or Bathtub Space.

Receptacle outlets shall not be installed in or within reach [750 mm (30 in.)] of a shower or bathtub space.

(2) Face-Up Position.

A receptacle shall not be installed in a face-up position in any countertop or other similar horizontal surface.

552.42 Branch-Circuit Protection.

(A) Rating.

The branch-circuit overcurrent devices shall be rated as follows:

(1) Not more than the circuit conductors

(2) Not more than 150 percent of the rating of a single appliance rated 13.3 amperes or more and supplied by an individual branch circuit

(3) Not more than the overcurrent protection size marked on an air conditioner or other motor-operated appliances.

(B) Protection for Smaller Conductors.

A 20-ampere fuse or circuit breaker shall be permitted for protection for fixtures, including luminaires, leads, cords, or small appliances, and 14 AWG tap conductors, not over 1.8 m (6 ft) long for recessed luminaires.

(C) Fifteen-Ampere Receptacle Considered Protected by 20 Amperes.

If more than one receptacle or load is on a branch circuit, 15-ampere receptacles shall be permitted to be protected by a 20-ampere fuse or circuit breaker.

552.43 Power Supply.

(A) Feeder.

The power supply to the park trailer shall be a feeder assembly consisting of not more than one listed 30-ampere or 50-ampere park trailer power-supply cord, with an integrally molded or securely attached cap, or a permanently installed feeder.

(B) Power-Supply Cord.

If the park trailer has a power-supply cord, it shall be permanently attached to the panelboard, or to a junction box permanently connected to the panelboard, with the free end terminating in a molded-on attachment plug cap.

Cords with adapters and pigtail ends, extension cords, and similar items shall not be attached to, or shipped with, a park trailer.

A suitable clamp or the equivalent shall be provided at the panelboard knockout to afford strain relief for the cord to prevent strain from being transmitted to the terminals when the power-supply cord is handled in its intended manner.

The cord shall be a listed type with 3-wire, 120-volt or 4-wire, 120/240-volt conductors, one of which shall be identified by a continuous green color or a continuous green color with one or more yellow stripes for use as the equipment grounding conductor.

(C) Mast Weatherhead or Raceway.

Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of one of the following:

(1) One mast weatherhead installation, installed in accordance with Article 230, containing four continuous, insulated, color-coded feeder conductors, one of which shall be an equipment grounding conductor

(2) A rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, or other raceways suitable for the location from the disconnecting means in the park trailer to the underside of the park trailer

552.44 Cord.

(A) Permanently Connected.

Each power-supply assembly shall be factory supplied or factory installed and connected directly to the terminals of the panelboard or conductors within a junction box and provided with means to prevent strain from being transmitted to the terminals. The ampacity of the conductors between each junction box and the terminals of each panelboard shall be at least equal to the ampacity of the power-supply cord. The supply end of the assembly shall be equipped with an attachment plug of the type described in 552.44(C). Where the cord passes through the walls or floors, it shall be protected by means of conduit and bushings or equivalent. The cord assembly shall have permanent provisions for protection against corrosion and mechanical damage while the unit is in transit.

(B) Cord Length.

The cord-exposed usable length shall be measured from the point of entrance to the park trailer or the face of the flanged surface inlet (motor-base attachment plug) to the face of the attachment plug at the supply end.

The cord-exposed usable length, measured to the point of entry on the unit exterior, shall be a minimum of 7.0 m (23 ft) where the point of entrance is at the side of the unit, or shall be a minimum 8.5 m (28 ft) where the point of entrance is at the rear of the unit. The maximum length shall not exceed 11 m (36½ ft).

Where the cord entrance into the unit is more than 900 mm (3 ft) above the ground, the minimum cord lengths above shall be increased by the vertical distance of the cord entrance heights above 900 mm (3 ft).

(C) Attachment Plugs.

(1) Units with Two to Five 15- or 20-Ampere Branch Circuits.

Park trailers wired in accordance with 552.46(A) shall have an attachment plug that shall be 2-pole, 3-wire grounding type, rated 30 amperes, 125 volts, conforming to the configuration shown in Figure 552.44(C)(1) intended for use with units rated at 30 amperes, 125 volts.

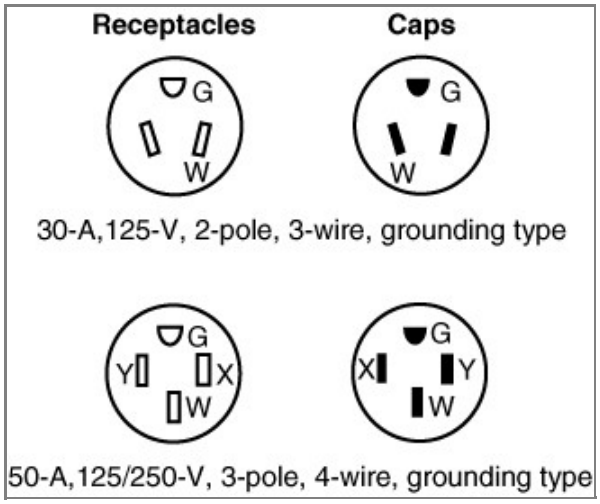
Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure TT, for complete details of this configuration.

(2) Units with 50-Ampere Power Supply Assembly.

Park trailers having a power-supply assembly rated 50 amperes as permitted by 552.43(B) shall have a 3-pole, 4-wire grounding-type attachment plug rated 50 amperes, 125/250 volts, conforming to the configuration shown in Figure 552.44(C)(1).

Informational Note: Complete details of this configuration can be found in ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure 14-50.

Figure 552.44(C)(1) Attachment Cap and Receptacle Configurations.



(D) Labeling at Electrical Entrance.

Each park trailer shall have a safety label with the signal word WARNING in minimum 6 mm (¼ in.) high letters and body text in minimum 3 mm (⅛ in.) high letters on a contrasting background. The safety label shall be affixed to the exterior skin, at or near the point of entrance of the power-supply assembly and shall read, as appropriate:

WARNING:

THIS CONNECTION IS FOR 110–125-VOLT AC,

60 HZ, 30-AMPERE SUPPLY

or

WARNING:

THIS CONNECTION IS FOR 208Y/120-VOLT OR 120/240-VOLT AC, 3-POLE, 4-WIRE, 60 HZ, _____-AMPERE SUPPLY.

followed by

DO NOT EXCEED THE CIRCUIT RATING. EXCEEDING THE CIRCUIT RATING CAN CAUSE A FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

The correct ampere rating shall be marked in the blank space and the label shall meet the requirements in 110.21(B).

(E) Location.

The point of entrance of a power-supply assembly shall be located on either side or the rear, within 450 mm (18 in.), of an outside wall.

552.45 Panelboard.

(A) Listed and Appropriately Rated.

A listed and appropriately rated panelboard shall be used. The grounded conductor termination bar shall be insulated from the enclosure as provided in 552.55(C). An equipment grounding terminal bar shall be attached inside the metal enclosure of the panelboard.

(B) Location.

The panelboard shall be installed in a readily accessible location. Working clearance for the panelboard shall be not less than 600 mm (24 in.) wide and 750 mm (30 in.) deep.

Exception: Where the panelboard cover is exposed to the inside aisle space, one of the working clearance dimensions shall be permitted to be reduced to a minimum of 550 mm (22 in.). A panelboard shall be considered exposed where the panelboard cover is within 50 mm (2 in.) of the aisle's finished surface or not more than 25 mm (1 in.) from the backside of doors that enclose the space.

(C) Dead-Front Type.

The panelboard shall be of the dead-front type. A main disconnecting means shall be provided where fuses are used or where more than two circuit breakers are employed. A main overcurrent protective device not exceeding the power-supply assembly rating shall be provided where more than two branch circuits are employed.

552.46 Branch Circuits.

Branch circuits shall be determined in accordance with 552.46(A) and (B).

(A) Two to Five 15- or 20-Ampere Circuits.

A maximum of five 15- or 20-ampere circuits to supply lights, receptacle outlets, and fixed appliances shall be permitted. Such park trailers shall be permitted to be equipped with panelboards rated at 120 volt maximum or 120/240 volt maximum and listed for a 30-ampere-rated main power supply assembly. Not more than two 120-volt thermostatically controlled appliances shall be installed in such systems unless appliance isolation switching, energy management systems, or similar methods are used.

Exception No. 1: Additional 15- or 20-ampere circuits shall be permitted where a listed energy management system rated at 30 amperes maximum is employed within the system.

Exception No. 2: Six 15- or 20-ampere circuits shall be permitted without employing an energy management system, provided that the added sixth circuit serves only the power converter, and the combined load of all six circuits does not exceed the allowable load that was designed for use by the original five circuits.

Informational Note: See 210.23(B) for permissible loads. See 552.45(C) for main disconnect and overcurrent protection requirements.

(B) More Than Five Circuits.

Where more than five circuits are needed, they shall be determined in accordance with 552.46(B)(1), (B)(2), and (B)(3).

(1) Lighting.

Based on 33 volt-amperes/m^2 (3 VA/ft^2) multiplied by the outside dimensions of the park trailer (coupler excluded) divided by 120 volts to determine the number of 15- or 20-ampere lighting area circuits, for example,

$$\frac{3 \times \text{length} \times \text{width}}{120 \times 15 \text{ (or } 20)} = \text{No. of 15- (or 20-) ampere circuits} \quad \textbf{[552.46(B)(1)]}$$

The lighting circuits shall be permitted to serve listed cord-connected kitchen waste disposers and to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter-mounted cooking units.

(2) Small Appliances.

Small-appliance branch circuits shall be installed in accordance with 210.11(C)(1).

(3) General Appliances.

(including furnace, water heater, space heater, range, and central or room air conditioner, etc.) An individual branch circuit shall be permitted to supply any load for which it is rated. There shall be one or more circuits of adequate rating in accordance with 552.46(B)(3)(a) through (B)(3)(d).

Informational Note No. 1: See 210.11(C)(2) for laundry branch circuit.

Informational Note No. 2: See Article 440 for central air conditioning.

(a) The total rating of fixed appliances shall not exceed 50 percent of the circuit rating if lighting outlets, general-use receptacles, or both are also supplied.

(b) For fixed appliances with a motor(s) larger than ⅛ horsepower, the total calculated load shall be based on 125 percent of the largest motor plus the sum of the other loads. Where a branch circuit supplies continuous load(s) or any combination of continuous and noncontinuous loads, the branch-circuit conductor size shall be in accordance with 210.19(A).

(c) The rating of a single cord-and-plug-connected appliance supplied by other than an individual branch circuit shall not exceed 80 percent of the circuit rating.

(d) The rating of a range branch circuit shall be based on the range demand as specified for ranges in 552.47(B)(5).

552.47 Calculations.

The following method shall be employed in computing the supply-cord and distribution-panelboard load for each feeder assembly for each park trailer in lieu of the procedure shown in Article 220 and shall be based on a 3-wire, 208Y/120-volt or 120/240-volt supply with 120-volt loads balanced between the two phases of the 3-wire system.

(A) Lighting and Small-Appliance Load.

Lighting Volt-Amperes: Length times width of park trailer floor (outside dimensions) times 33 volt-amperes/m^2 (3 VA/ft^2). For example,

Length × width × 3 = lighting volt-amperes

Small-Appliance Volt-Amperes: Number of circuits times 1500 volt-amperes for each 20-ampere appliance receptacle circuit (see definition of *Appliance, Portable* with fine print note) including 1500 volt-amperes for laundry circuit. For example,

No. of circuits × 1500 = small-appliance volt-amperes

Total: Lighting volt-amperes plus small-appliance volt-amperes = total volt-amperes

First 3000 total volt-amperes at 100 percent plus remainder at 35 percent = volt-amperes to be divided by 240 volts to obtain current (amperes) per leg.

(B) Total Load for Determining Power Supply.

Total load for determining power supply is the sum of the following:

(1) Lighting and small-appliance load as calculated in 552.47(A).

(2) Nameplate amperes for motors and heater loads (exhaust fans, air conditioners, electric, gas, or oil heating). Omit smaller of the heating and cooling loads, except include blower motor if used as air-conditioner evaporator motor. Where an air conditioner is not installed and a 50-ampere power-supply cord is provided, allow 15 amperes per phase for air conditioning.

(3) Twenty-five percent of current of largest motor in 552.47(B)(2).

(4) Total of nameplate amperes for disposal, dishwasher, water heater, clothes dryer, wall-mounted oven, cooking units. Where the number of these appliances exceeds three, use 75 percent of total.

(5) Derive amperes for freestanding range (as distinguished from separate ovens and cooking units) by dividing the following values by 240 volts as shown in Table 552.47(B).

(6) If outlets or circuits are provided for other than factory-installed appliances, include the anticipated load.

Informational Note: See Informative Annex D, Example D12, for an illustration of the application of this calculation.

Table 552.47(B) Minimum Loads for Freestanding Electric Ranges

Nameplate Rating (watts)	Use (volt-amperes)
0–10,000	80 percent of rating
Over 10,000–12,500	8,000
Over 12,500–13,500	8,400
Over 13,500–14,500	8,800
Over 14,500–15,500	9,200
Over 15,500–16,500	9,600
Over 16,500–17,500	10,000

(C) Optional Method of Calculation for Lighting and Appliance Load.

For park trailers, the optional method for calculating lighting and appliance load shown in 220.82 shall be permitted.

552.48 Wiring Methods.

(A) Wiring Systems.

Cables and raceways installed in accordance with Articles 320, 322, 330 through 340, 342 through 362, 386, and 388 shall be permitted in accordance with their applicable article, except as otherwise specified in this article. An equipment grounding means shall be provided in accordance with 250.118.

(B) Conduit and Tubing.

Where rigid metal conduit or intermediate metal conduit is terminated at an enclosure with a locknut and bushing connection, two locknuts shall be provided, one inside and one outside of the enclosure. All cut ends of conduit and tubing shall be reamed or otherwise finished to remove rough edges.

(C) Nonmetallic Boxes.

Nonmetallic boxes shall be acceptable only with nonmetallic-sheathed cable or nonmetallic raceways.

(D) Boxes.

In walls and ceilings constructed of wood or other combustible material, boxes and fittings shall be flush with the finished surface or project therefrom.

(E) Mounting.

Wall and ceiling boxes shall be mounted in accordance with 314.23.

Exception No. 1: Snap-in-type boxes or boxes provided with special wall or ceiling brackets that securely fasten boxes in walls or ceilings shall be permitted.

Exception No. 2: A wooden plate providing a 38-mm (1½-in.) minimum width backing around the box and of a thickness of 13 mm (½ in.) or greater (actual) attached directly to the wall panel shall be considered as approved means for mounting outlet boxes.

(F) Cable Sheath.

The sheath of nonmetallic-sheathed cable, and the armor of metal-clad cable and Type AC cable, shall be continuous between outlet boxes and other enclosures.

(G) Protected.

Metal-clad, Type AC, or nonmetallic-sheathed cables and electrical nonmetallic tubing shall be permitted to pass through the centers of the wide side of 2 by 4 wood studs. However, they shall be protected where they pass through 2 by 2 wood studs or at other wood studs or frames where the cable or tubing would be less than 32 mm (1¼ in.) from the inside or outside surface. Steel plates on each side of the cable or tubing, or a steel tube, with not less than 1.35 mm (0.053 in.) wall thickness, shall be installed to protect the cable or tubing. These plates or tubes shall be securely held in place. Where nonmetallic-sheathed cables pass through punched, cut, or drilled slots or holes in metal members, the cable shall be protected by bushings or grommets securely fastened in the opening prior to installation of the cable.

(H) Cable Supports.

Where connected with cable connectors or clamps, cables shall be secured and supported within 300 mm (12 in.) of outlet boxes, panelboards, and splice boxes on appliances. Supports and securing shall be provided at intervals not exceeding 1.4 m (4½ ft) at other places.

(I) Nonmetallic Box Without Cable Clamps.

Nonmetallic-sheathed cables shall be secured and supported within 200 mm (8 in.) of a nonmetallic outlet box without cable clamps. Where wiring devices with integral enclosures are employed with a loop of extra cable to permit future replacement of the device, the cable loop shall be considered as an integral portion of the device.

(J) Physical Damage.

Where subject to physical damage, exposed nonmetallic cable shall be protected by covering boards, guard strips, raceways, or other means.

(K) Receptacle Faceplates.

Metal faceplates shall comply with 406.6(A). Nonmetallic faceplates shall comply with 406.6(C).

(L) Metal Faceplates Grounded.

Where metal faceplates are used, they shall be grounded.

(M) Moisture or Physical Damage.

Where outdoor or under-chassis wiring is 120 volts, nominal, or over and is exposed to moisture or physical damage, the wiring shall be protected by rigid metal conduit, by intermediate metal conduit, by electrical metallic tubing, by rigid polyvinyl chloride conduit, by other raceways identified for the location, or by Type MI cable that is closely routed against frames and equipment enclosures or other raceway or cable identified for the application.

(N) Component Interconnections.

Fittings and connectors that are intended to be concealed at the time of assembly shall be listed and identified for the interconnection of building components. Such fittings and connectors shall be equal to the wiring method employed in insulation, temperature rise, and fault-current withstanding, and shall be capable of enduring the vibration and shock occurring in park trailers.

(O) Method of Connecting Expandable Units.

The method of connecting expandable units to the main body of the park trailer shall comply with 552.48(O)(1) and 552.48(O)(2) as applicable.

(1) Cord-and-Plug Connected.

Cord-and-plug connections shall comply with 552.48(O)(1)(a) through (O)(1)(d).

(a) The portion of a branch circuit that is installed in an expandable unit shall be permitted to be connected to the portion of the branch circuit in the main body of the vehicle by means of an attachment plug and cord listed for hard usage. The cord and its connections shall comply with Parts I and II of Article 400 and shall be considered as a permitted use under 400.10. Where the attachment plug and cord are located within the park trailer's interior, use of plastic thermoset or elastomer parallel cord Type SPT-3, SP-3, or SPE shall be permitted.

(b) Where the receptacle provided for connection of the cord to the main circuit is located on the outside of the park trailer, it shall be protected with a ground-fault circuit interrupter for personnel and be listed for wet locations. A cord located on the outside of a park trailer shall be identified for outdoor use.

(c) Unless removable or stored within the park trailer interior, the cord assembly shall have permanent provisions for protection against corrosion and mechanical damage while the park trailer is in transit.

(d) The attachment plug and cord shall be installed so as not to permit exposed live attachment plug pins.

(2) Direct Wires Connected.

That portion of a branch circuit that is installed in an expandable unit shall be permitted to be connected to the portion of the branch circuit in the main body of the park trailer by means of flexible cord installed in accordance with 552.48(O)(2)(a) through (O)(2)(f) or other approved wiring method.

(a) The flexible cord shall be listed for hard usage and for use in wet locations.

(b) The flexible cord shall be permitted to be exposed on the underside of the vehicle.

(c) The flexible cord shall be permitted to pass through the interior of a wall or floor assembly or both a maximum concealed length of 600 mm (24 in.) before terminating at an outlet or junction box.

(d) Where concealed, the flexible cord shall be installed in nonflexible conduit or tubing that is continuous from the outlet or junction box inside the park trailer to a weatherproof outlet box, junction box, or strain relief fitting listed for use in wet locations that is located on the underside of the park trailer. The outer jacket of flexible cord shall be continuous into the outlet or junction box.

(e) Where the flexible cord passes through the floor to an exposed area inside of the park trailer, it shall be protected by means of conduit and bushings or equivalent.

(f) Where subject to physical damage, the flexible cord shall be protected with RMC, IMC, Schedule 80 PVC, reinforced thermosetting resin conduit (RTRC) listed for exposure to physical damage, or other approved means and shall extend at least 150 mm (6 in.) above the floor. A means shall be provided to secure the flexible cord where it enters the park trailer.

(P) Prewiring for Air-Conditioning Installation.

Prewiring installed for the purpose of facilitating future air-conditioning installation shall comply with the applicable portions of this article and the following:

(1) An overcurrent protective device with a rating compatible with the circuit conductors shall be installed in the panelboard and wiring connections completed.

(2) The load end of the circuit shall terminate in a junction box with a blank cover or other listed enclosure. Where a junction box with a blank cover is used, the free ends of the conductors shall be adequately capped or taped.

(3) A safety label with the word WARNING in minimum 6 mm (¼ in.) high letters and body text in minimum 3 mm (⅛ in.) high letters on a contrasting background shall be affixed on or adjacent to the junction box and shall read as follows:

WARNING

AIR-CONDITIONING CIRCUIT.

THIS CONNECTION IS FOR AIR CONDITIONERS

RATED 110–125-VOLT AC, 60 HZ,

____ AMPERES MAXIMUM.

DO NOT EXCEED CIRCUIT RATING.

EXCEEDING THE CIRCUIT RATING MAY

CAUSE A FIRE AND RESULT IN

DEATH OR SERIOUS INJURY

An ampere rating not to exceed 80 percent of the circuit rating shall be legibly marked in the blank space.

(4) The circuit shall serve no other purpose.

(Q) Prewiring for Other Circuits.

Prewiring installed for the purpose of installing other appliances or devices shall comply with the applicable portions of this article and the following:

(1) An overcurrent protection device with a rating compatible with the circuit conductors shall be installed in the panelboard with wiring connections completed.

(2) The load end of the circuit shall terminate in a junction box with a blank cover or a device listed for the purpose. Where a junction box with blank cover is used, the free ends of the conductors shall be adequately capped or taped.

(3) A safety label with the signal word WARNING in minimum 6 mm (¼ in.) high letters and body text in minimum 3 mm (⅛ in.) high letters on a contrasting background shall be affixed on or adjacent to the junction box or device listed for the purpose and shall read as follows:

WARNING

THIS CONNECTION IS FOR _____ RATED _____ VOLT AC, 60 HZ, _____ AMPERES MAXIMUM. DO NOT EXCEED CIRCUIT RATING. EXCEEDING THE CIRCUIT RATING MAY CAUSE A FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

An ampere rating not to exceed 80 percent of the circuit rating shall be legibly marked in the blank space.

552.49 Maximum Number of Conductors in Boxes.

The maximum number of conductors permitted in boxes shall be in accordance with 314.16.

552.50 Grounded Conductors.

The identification of grounded conductors shall be in accordance with 200.6.

552.51 Connection of Terminals and Splices.

Conductor splices and connections at terminals shall be in accordance with 110.14.

552.52 Switches.

Switches shall be rated as required by 552.52(A) and (B).

(A) Lighting Circuits.

For lighting circuits, switches shall be rated not less than 10 amperes, 120/125 volts, and in no case less than the connected load.

(B) Motors or Other Loads.

For motors or other loads, switches shall have ampere or horsepower ratings, or both, adequate for loads controlled. (An ac general-use snap switch shall be permitted to control a motor 2 hp or less with full-load current not over 80 percent of the switch ampere rating.)

(C) Location.

Switches shall not be installed within wet locations in tub or shower spaces unless installed as part of a listed tub or shower assembly.

552.53 Receptacles.

All receptacle outlets shall be of the grounding type and installed in accordance with 210.21 and 406.4.

552.54 Luminaires.

(A) General.

Any combustible wall or ceiling finish exposed between the edge of a canopy or pan of a luminaire or ceiling suspended (paddle) fan and the outlet box shall be covered with noncombustible material or a material identified for the purpose.

(B) Shower Luminaires.

If a luminaire is provided over a bathtub or in a shower stall, it shall be of the enclosed and gasketed type and listed for the type of installation, and it shall be ground-fault circuit-interrupter protected.

(C) Outdoor Outlets, Luminaires, Air-Cooling Equipment, and So On.

Outdoor luminaires and other equipment shall be listed for outdoor use or wet locations.

552.55 Grounding.

(See also 552.57 on bonding of non–current-carrying metal parts.)

(A) Power-Supply Grounding.

The equipment grounding conductor in the supply cord or feeder shall be connected to the equipment grounding bus or other approved equipment grounding means in the panelboard.

(B) Panelboard.

The panelboard shall have an equipment grounding bus with sufficient terminals for all equipment grounding conductors or other approved grounding means.

(C) Insulated Grounded Conductor.

The grounded circuit conductor shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts. The grounded circuit conductor terminals in the panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps, or buses in the panelboard or in appliances shall be removed and discarded. Connection of electric ranges and electric clothes dryers utilizing a grounded conductor, if cord-connected, shall be made with 4-conductor cord and 3-pole, 4-wire, grounding-type plug caps and receptacles.

552.56 Interior Equipment Grounding.

(A) Exposed Metal Parts.

In the electrical system, all exposed metal parts, enclosures, frames, luminaire canopies, and so forth, shall be effectively bonded to the grounding terminals or enclosure of the panelboard.

(B) Equipment Grounding Conductors.

Bare conductors or conductors with insulation or individual covering that is green or green with one or more yellow stripes shall be used for equipment grounding conductors only.

(C) Grounding of Electrical Equipment.

Where grounding of electrical equipment is specified, it shall be permitted as follows:

(1) Connection of metal raceway (conduit or electrical metallic tubing), the sheath of Type MC and Type MI cable where the sheath is identified for grounding, or the armor of Type AC cable to metal enclosures.

(2) A connection between the one or more equipment grounding conductors and a metal box by means of a grounding screw, which shall be used for no other purpose, or a listed grounding device.

(3) The equipment grounding conductor in nonmetallic-sheathed cable shall be permitted to be secured under a screw threaded into the luminaire canopy other than a mounting screw or cover screw or attached to a listed grounding means (plate) in a nonmetallic outlet box for luminaire mounting (grounding means shall also be permitted for luminaire attachment screws).

(D) Grounding Connection in Nonmetallic Box.

A connection between the one or more grounding conductors brought into a nonmetallic outlet box shall be arranged so that a connection can be made to any fitting or device in that box that requires grounding.

(E) Grounding Continuity.

Where more than one equipment grounding conductor of a branch circuit enters a box, all such conductors shall be in good electrical contact with each other, and the arrangement shall be such that the disconnection or removal of a receptacle, fixture, including a luminaire, or other device fed from the box will not interfere with or interrupt the grounding continuity.

(F) Cord-Connected Appliances.

Cord-connected appliances, such as washing machines, clothes dryers, refrigerators, and the electrical system of gas ranges, and so on, shall be grounded by means of an approved cord with equipment grounding conductor and grounding-type attachment plug.

552.57 Bonding of Non–Current-Carrying Metal Parts.

(A) Required Bonding.

All exposed non–current-carrying metal parts that are likely to become energized shall be effectively bonded to the grounding terminal or enclosure of the panelboard.

(B) Bonding Chassis.

A bonding conductor shall be connected between any panelboard and an accessible terminal on the chassis. Bonding terminations shall be suitable for the environment in which the conductors and terminations are installed.

Exception: Any park trailer that employs a unitized metal chassis-frame construction to which the panelboard is securely fastened with a bolt(s) and nut(s) or by welding or riveting shall be considered to be bonded.

(C) Bonding Conductor Requirements.

Grounding terminals shall be of the solderless type and listed as pressure terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare, and shall be 8 AWG copper minimum or equivalent.

(D) Metallic Roof and Exterior Bonding.

The metal roof and exterior covering shall be considered bonded where both of the following conditions apply:

(1) The metal panels overlap one another and are securely attached to the wood or metal frame parts by metal fasteners.

(2) The lower panel of the metal exterior covering is secured by metal fasteners at each cross member of the chassis, or the lower panel is connected to the chassis by a metal strap.

(E) Gas, Water, and Waste Pipe Bonding.

The gas, water, and waste pipes shall be considered grounded if they are bonded to the chassis.

(F) Furnace and Metal Air Duct Bonding.

Furnace and metal circulating air ducts shall be bonded.

552.58 Appliance Accessibility and Fastening.

Every appliance shall be accessible for inspection, service, repair, and replacement without removal of permanent construction. Means shall be provided to securely fasten appliances in place when the park trailer is in transit.

552.59 Outdoor Outlets, Fixtures, Including Luminaires, Air-Cooling Equipment, and So On.

(A) Listed for Outdoor Use.

Outdoor fixtures, including luminaires, and equipment shall be listed for outdoor use. Outdoor receptacle outlets shall be in accordance with 406.9(A) and (B). Switches and circuit breakers installed outdoors shall comply with 404.4.

(B) Outside Heating Equipment, Air-Conditioning Equipment, or Both.

A park trailer provided with a branch circuit designed to energize outside heating equipment or air-conditioning equipment, or both, located outside the park trailer, other than room air conditioners, shall have such branch-circuit conductors terminate in a listed outlet box or disconnecting means located on the outside of the park trailer. A safety label with the word WARNING in minimum 6 mm (¼ in.) high letters and body text in minimum 3 mm (⅛ in.) high letters on a contrasting background shall be affixed within 150 mm (6 in.) from the listed box or disconnecting means and shall read as follows:

WARNING

THIS CONNECTION IS FOR HEATING

AND/OR AIR-CONDITIONING EQUIPMENT.

THE BRANCH CIRCUIT IS RATED AT NOT MORE THAN _____ AMPERES, AT _____ VOLTS, 60 HZ, _____ CONDUCTOR AMPACITY.

A DISCONNECTING MEANS SHALL BE

LOCATED WITHIN SIGHT OF THE EQUIPMENT.

EXCEEDING THE CIRCUIT RATING MAY CAUSE A FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

The correct voltage and ampere rating shall be given.

Part V. Factory Tests

552.60 Factory Tests (Electrical).

Each park trailer shall be subjected to the tests required by 552.60(A) and (B).

(A) Circuits of 120 Volts or 120/240 Volts.

Each park trailer designed with a 120-volt or a 120/240-volt electrical system shall withstand the applied voltage without electrical breakdown of a 1 minute, 900-volt dielectric strength test, or a 1 second, 1080-volt dielectric strength test, with all switches closed, between ungrounded and grounded conductors and the park trailer ground. During the test, all switches and other controls shall be in the “on” position. Fixtures, including luminaires, and permanently installed appliances shall not be required to withstand this test.

Each park trailer shall be subjected to the following:

(1) A continuity test to ensure that all metal parts are properly bonded

(2) Operational tests to demonstrate that all equipment is properly connected and in working order

(3) Polarity checks to determine that connections have been properly made

(4) Receptacles requiring GFCI protection shall be tested for correct function by the use of a GFCI testing device

(B) Low-Voltage Circuits.

An operational test of low-voltage circuits shall be conducted to demonstrate that all equipment is connected and in electrical working order. This test shall be performed in the final stages of production after all outer coverings and cabinetry have been secured.

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair, Dave Watson, (CMP 6) and Dean Hunter (CMP 7). The task group was assigned the following charge. The Correlating Committee notes that more than one related term is being used for “Power-Supply Cord.” Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. In addressing the multiple definitions for power supply cord, the task group identified a correlation issue relative to the use of the terms “Power-Supply Assembly” and “Feeder Assembly”.

The definition for “Power-Supply Assembly” is specific to Article 551, “Feeder Assembly” is a defined term used in Article 550, which is very similar to the term “Power-Supply Assembly” as used in Articles 551 and 552. To eliminate some correlation issues when using these two different terms within articles under CMP-7 purview, it would make sense to modify the existing definition for “Feeder Assembly” and exchange the term “Power-Supply Assembly” with “Feeder Assembly” where it is used in Articles 551 and 552. The task group is recommending to delete the definition for “Power-Supply Assembly”, and combine the definition for “Power-Supply Assembly” with “Feeder Assembly”. Additionally, term “Power-Supply Assembly” would be replaced with the term with “Feeder Assembly” where it is used in Articles 551 and 552.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]	Definition for a related term
Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]	Definition for a related term
Public Comment No. 1869-NFPA 70-2021 [Article 551]	Definition for a related term
Public Comment No. 1660-NFPA 70-2021 [Definition: Power-Supply Assembly.]	
Public Comment No. 1664-NFPA 70-2021 [Definition: Feeder Assembly.]	
Public Comment No. 1869-NFPA 70-2021 [Article 551]	

Related Item

- FR 9274 (Global Input)

Submitter Information Verification

Submitter Full Name: John Kovacik
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Submittal Date: Wed Aug 18 13:19:09 EDT 2021
Committee: NEC-P07

Public Comment No. 797-NFPA 70-2021 [Section No. 552.4]

552.4 General Requirements.

A park trailer as specified in 552.2 is intended for seasonal use. It is not intended as a permanent dwelling unit or for commercial uses such as banks, clinics, offices, or similar. Units designed for such purposes are classified as relocatable structures and are covered in Part II of Article 545.

Additional Proposed Changes

File Name	Description	Approved
7_CN_330.pdf	7 CN330	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 330 appeared in the First Draft Report on First Revision No. 7892.

The Correlating Committee directs the Panel to review NEC 552.4 and the necessity to reference 552.2 since the definition has been moved to Article 100. Compliance with NEC 90.3 and Section 4.1.1 of the Style Manual must also be considered.

Related Item

• First Revision No. 7892

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
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City:
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Zip:
Submittal Date: Wed Aug 04 10:54:54 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 330-NFPA 70-2021 [Section No. 552.4]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:12:26 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to review NEC 552.4 and the necessity to reference 552.2 since the definition has been moved to Article 100. Compliance with NEC 90.3 and Section 4.1.1 of the Style Manual must also be considered.

First Revision No. 7892-NFPA 70-2020 [Section No. 552.4]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 799-NFPA 70-2021 [Section No. 552.41(A)]

(A) Spacing.

Receptacle outlets shall be installed at wall spaces 600 mm (2 ft) wide or more so that no point along the floor line is more than 1.8 m (6 ft), measured horizontally, from an outlet in that space.

Exception No. 1: Bath and hallway areas shall be exempt from outlet spacing requirements.

Exception No. 2: Wall spaces occupied by kitchen cabinets, wardrobe cabinets, built-in furniture; behind doors that may open fully against a wall surface; or similar facilities.

Additional Proposed Changes

File Name	Description	Approved
7_CN_331.pdf	7 CN331	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 331 appeared in the First Draft Report on First Revision No. 8236.

The Correlating Committee directs the Panel to review the permissive language "shall be exempt" in the revised language to comply with Section 3.1.4.1 in the NEC style manual by potentially using the phrase "shall be permitted" in order to not prohibit the main rule.

Related Item

• First Revision No. 8236

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
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Zip:
Submittal Date: Wed Aug 04 10:57:01 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 331-NFPA 70-2021 [Section No. 552.41(A)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:13:50 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to review the permissive language “shall be exempt” in the revised language to comply with Section 3.1.4.1 in the NEC style manual by potentially using the phrase “shall be permitted” in order to not prohibit the main rule.

First Revision No. 8236-NFPA 70-2020 [Section No. 552.41(A)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 140-NFPA 70-2021 [Section No. 552.43(C)]

(C) Mast Weatherhead or Raceway.

Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of one of the following:

(1) One mast weatherhead installation, installed in accordance with Article 230, containing four continuous, insulated, color-coded feeder conductors, one of which shall be an equipment grounding conductor

(2) A rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, RTRC, or other raceways suitable for the location from the disconnecting means in the park trailer to the underside of the park trailer

Statement of Problem and Substantiation for Public Comment

The substantiation in PI-4623 that resulted in replacing the term “Rigid Nonmetallic Conduit” with rigid polyvinyl chloride conduit is not correct.

Prior to the introduction of Articles 353 and 355, the term Rigid Nonmetallic Conduit was a generic term that included HDPE, PVC and RTRC, or any other type of rigid conduit made from non-metallic materials.
Nothing in the definition of RNC or in the construction specifications found in Article 347 placed any requirement for RNC to be made from any specific nonmetallic material.
The Fine Print Note following 347-1, going as far back as the 1981 code included a number of materials that would be suitable for the construction of RNC. Those materials included “fiberglass epoxy”, high-density polyethylene and polyvinyl chloride, as well as others.
In the 1999 code, a new "Table 347-9(B) Expansion Characteristics of Fiberglass Reinforced Conduit (Rigid Nonmetallic Conduit)" was added to the code.

It is clear to that prior to Article 347 being split into the 3 different types of RNC, that any reference to RNC in other code articles included all of types of RNC and there was no attempt to limit the term RNC to PVC.

While HDPE would not be suitable for the application in this section, there is no reason to prohibit the use of RTRC raceways for this application.

Related Item

• PI-4623 • FR-7898 • PC-141 • PC-142 • PC-149

Submitter Information Verification

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Submittal Date: Tue Jul 06 16:56:51 EDT 2021
Committee: NEC-P07

Public Comment No. 1718-NFPA 70-2021 [Section No. 552.43(C)]

(C) Mast Weatherhead or Raceway.

Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of one of the following:

(1) One mast weatherhead installation, installed in accordance with Article 230, containing four continuous, insulated, color-coded feeder conductors, one of which shall be an equipment grounding conductor

(2) A rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, or other raceways ~~suitable~~ identified for the location from the disconnecting means in the park trailer to the underside of the park trailer

Statement of Problem and Substantiation for Public Comment

All of the public inputs accepted by CMP-7 related to the use of the term “Polyvinyl Chloride” as a recognized type of wiring method is consistent with the way that other types or raceways and conduits have been added in other NEC Articles for years. However, by adding words, “or other raceways suitable for the location” is too vague of a term. What does “suitable” mean? The term added should have been, “or other raceways identified for the location” as “identified” is a defined word in Article 100. Adding the term, “or other raceways identified for the location” would allowed the user of the Code the use of other non-metallic raceways identified for the environment or location.

Related Item

• FR 7898 • PI 4623

Submitter Information Verification

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Submittal Date: Tue Aug 17 14:06:02 EDT 2021
Committee: NEC-P07

Public Comment No. 817-NFPA 70-2021 [Section No. 552.48(K)]

(K) Receptacle Faceplates.

Metal faceplates shall comply with 406.6(A). Nonmetallic faceplates shall comply with 406.6(C).

Additional Proposed Changes

File Name	Description	Approved
7_CN_332.pdf	7 CN332	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No.332 appeared in the First Draft Report on First Revision No. 7900.

The Correlating Committee directs the Panel to review references to 406.6, as well as other references in 552.48, for compliance with NEC 90.3 and Section 4.1.1 of the Style Manual. The requirement repeats general faceplate requirements from Article 406 and appears to be redundant.

The Correlating Committee directs the Panel to review 552.48(A) for references to entire articles to comply with the NEC Style Manual, 4.1.4.

Related Item

• First Revision No. 7900

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
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Street Address:
City:
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Zip:
Submittal Date: Wed Aug 04 12:27:26 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 332-NFPA 70-2021 [Section No. 552.48(K)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:16:50 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to review references to 406.6, as well as other references in 552.48, for compliance with NEC 90.3 and Section 4.1.1 of the Style Manual. The requirement repeats general faceplate requirements from Article 406 and appears to be redundant.

The Correlating Committee directs the Panel to review 552.48(A) for references to entire articles to comply with the NEC Style Manual, 4.1.4.

First Revision No. 7900-NFPA 70-2020 [Section No. 552.48(K)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
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Kendall, David H.
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Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 149-NFPA 70-2021 [Section No. 552.48(M)]

(M) Moisture or Physical Damage.

Where outdoor or under-chassis wiring is 120 volts, nominal, or over and is exposed to moisture or physical damage, the wiring shall be protected by rigid metal conduit, by intermediate metal conduit, by electrical metallic tubing, by rigid polyvinyl chloride conduit, by reinforced thermosetting resin conduit, by other raceways identified for the location, or by Type MI cable that is closely routed against frames and equipment enclosures or other raceway or cable identified for the application.

Statement of Problem and Substantiation for Public Comment

The substantiation in PI-4626 that resulted in replacing the term “Rigid Nonmetallic Conduit” with rigid polyvinyl chloride conduit is not correct.

Prior to the introduction of Articles 353 and 355, the term Rigid Nonmetallic Conduit was a generic term that included HDPE, PVC and RTRC, or any other type of rigid conduit made from non-metallic materials.
Nothing in the definition of RNC or in the construction specifications found in Article 347 placed any requirement for RNC to be made from any specific nonmetallic material.
The Fine Print Note following 347-1, going as far back as the 1981 code included a number of materials that would be suitable for the construction of RNC. Those materials included “fiberglass epoxy”, high-density polyethylene and polyvinyl chloride, as well as others.
In the 1999 code, a new "Table 347-9(B) Expansion Characteristics of Fiberglass Reinforced Conduit (Rigid Nonmetallic Conduit)" was added to the code.

It is clear to that prior to Article 347 being split into the 3 different types of RNC, that any reference to RNC in other code articles included all of types of RNC and there was no attempt to limit the term RNC to PVC.

While HDPE might not be suitable for the application in this section, there is no reason to prohibit the use of RTRC raceways for this application.

Related Item

• PI-4626 • FR-7903 • PC 140 • PC-141 • PC-142

Submitter Information Verification

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Submittal Date: Wed Jul 07 15:29:45 EDT 2021
Committee: NEC-P07

Public Comment No. 1232-NFPA 70-2021 [Section No. 555.6]

555.6 Load Calculations for Service and Feeder Conductors.

General lighting and other loads shall be calculated in accordance with Part III of Article 220, and, in addition, the demand factors set forth in Table 555.6 shall be permitted for each service and/or feeder circuit supplying receptacles that provide shore power for boats. These calculations shall be permitted to be modified as indicated in notes (1) and (2) to Table 555.6. Where demand factors of Table 555.6 are applied, the demand factor specified in 220.61(B) shall not be permitted.

Informational Note: These demand factors may be inadequate in areas of extreme hot or cold temperatures with loaded circuits for heating, air-conditioning, or refrigerating equipment.

Table 555.6 Demand Factors

Number of Shore Power Receptacles	Sum of the Rating of the Receptacles (%)
1–4	100
5–8	90
9–14	80
15–30	70
31–40	60
41–50	50
51–70	40
≥71	30

Notes:

1. Where shore power accommodations provide two receptacles specifically for an individual boat slip and these receptacles have different voltages (for example, one 30 ampere, 125 volt and one 50 ampere, 125/250 volt), only the receptacle with the larger kilowatt demand shall be required to be calculated.

2. ~~If the facility being installed includes individual~~ For each shore power pedestal being installed that includes an individual kilowatt-hour ~~submeters for~~ submeter for each slip and is being calculated using the criteria listed in Table 555.6, the total demand amperes shall be permitted to be multiplied by 0.9 to achieve the final demand amperes of the facility .

3. When a circuit feeding a boat hoist and shore power for the same boat slip is shared, only the load with the larger kilowatt demand shall be required to be counted in the load calculation.

Statement of Problem and Substantiation for Public Comment

The accuracy and reliability of the demand factors allowed for in Table 555.6 are logically dependent on the total number of shore power receptacles being fed by a single source. The allowable metered demand factor of 0.9, however, is unrelated to the number of slips that utilize a kilowatt-hour submeter. This metered demand factor is applicable and accurate for all metered slips' shore power, whether that is for all but one slip at a facility, or only for a single slip at a facility.

Related Item

• Table 555.6 Note 2 changed the word "may" to "shall be permitted to" in the Public Input Stage.

Submitter Information Verification

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Submittal Date: Wed Aug 11 10:07:57 EDT 2021
Committee: NEC-P07

Public Comment No. 1673-NFPA 70-2021 [Section No. 555.6]

~~**555.6** Load Calculations for Service and Feeder Conductors.~~

~~General lighting and other loads shall be calculated in accordance with Part III of Article 220 , and, in addition, the demand factors set forth in Table 555.6 shall be permitted for each service and/or feeder circuit supplying receptacles that provide shore power for boats. These calculations shall be permitted to be modified as indicated in notes (1) and (2) to Table 555.6 . Where demand factors of Table 555.6 are applied, the demand factor specified in 220.61(B) shall not be permitted.~~

~~Informational Note: These demand factors may be inadequate in areas of extreme hot or cold temperatures with loaded circuits for heating, air-conditioning, or refrigerating equipment.~~

~~Table 555.6 Demand Factors~~

~~Number of Shore Power Receptacles Sum of the Rating of the Receptacles~~

~~(%) 1–4 100 5–8 90 9–14 80 15–30 70 31–40 60 41–50 50 51–70 40 ≥71 30~~

~~Notes:~~

~~1. Where shore power accommodations provide two receptacles specifically for an individual boat slip and these receptacles have different voltages (for example, one 30 ampere, 125 volt and one 50 ampere, 125/250 volt), only the receptacle with the larger kilowatt demand shall be required to be calculated.~~

~~2. If the facility being installed includes individual kilowatt-hour submeters for each slip and is being calculated using the criteria listed in Table 555.6, the total demand amperes shall be permitted to be multiplied by 0.9 to achieve the final demand amperes.~~

~~3. When a circuit feeding a boat hoist and shore power for the same boat slip is shared, only the load with the larger kilowatt demand shall be required to be counted in the load calculation.~~

Statement of Problem and Substantiation for Public Comment

This is a companion PC to PC 1672 in hopes we can relocated this section to Article 220. 555.6 Load Calculations for Service and Feeder Conductors. This move does not seek to change the requirements for load calculations for marinas but rather relocate this section to Article 220. Article 220 is focused on load calculations and includes these calculations for many different installations throughout the NEC. It's important for any installer to understand that chapters 1 - 4 apply generally and that applies to Article 220. This should not be a challenge for those who design marinas as they should be very familiar with Chapters 1 - 4 of the NEC for many other reasons

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1672-NFPA 70-2021 [New Section after 220.57]	
Public Comment No. 1672-NFPA 70-2021 [New Section after 220.57]	

Related Item

- FR 7912

Submitter Information Verification

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Submittal Date: Tue Aug 17 09:16:27 EDT 2021
Committee: NEC-P07

Public Comment No. 1132-NFPA 70-2021 [Section No. 555.13]

555.13 Bonding of Non-Current-Carrying Metal Parts.

All metal parts in contact with the water, all metal piping, and all non-current-carrying metal parts that are likely to become energized shall be connected to the grounding bus in the panelboard using solid copper conductors; insulated, covered, or bare; ~~not smaller than 8 AWG.~~ Connections to bonded parts shall be made in accordance with 250.8.

Statement of Problem and Substantiation for Public Comment

This section is causing some major confusion in Maryland and will create some dangerous situations due to electrolysis as a byproduct of the section. Baltimore County is interpreting this to require a separate dedicated 8 AWG ground wire to be run from the grounding bar in the main breaker panel to a boat hoist and be physically attached to the boat hoist. This is in addition to the shielded ground wire in the power supply to the switching gear and motors. This in effect transforms the hoist into a grounding rod when it is in contact with the water and through the pilings when it is not in the water. It causes accelerated electrolysis on the unit and especially to the attaching fasteners that secures the hoists to the pilings. We have for 30 years stressed to our installers the need to be able to unplug or completely disconnect the the units with a 3 pole switch when not in use, primarily to disconnect the ground wire and slow down the electrolysis effect on the fastening hardware. With the unit permanently tied to the grounding bar, this will defeat that practice. I have seen units actually have their fasteners corrode corrode in half and let the structures fall into the water with a load in the hoist resulting in property damage.

Related Item

- public input

Submitter Information Verification

Submitter Full Name: David Norfolk
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Street Address:
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Submittal Date: Tue Aug 10 07:50:51 EDT 2021
Committee: NEC-P07

Public Comment No. 1701-NFPA 70-2021 [Section No. 555.14]

~~**555.14** Equipotential Planes and Bonding of Equipotential Planes.~~

~~An equipotential plane shall be installed where required in this section to mitigate step and touch voltages at electrical equipment.~~

~~**(A)** Areas Requiring Equipotential Planes.~~

~~Equipotential planes shall be installed adjacent to all outdoor service equipment or disconnecting means that control equipment in or on water where the following conditions exist:~~

~~(1) Where the system voltage exceeds 250 volts to ground~~

~~(2) Where the equipment is located within 3 m (10 ft) of the body of water~~

~~The equipotential plane shall include all metallic enclosures and controls that are likely to become energized and are accessible to personnel. The equipotential plane shall encompass the area around the equipment and shall extend from the area directly below the equipment out not less than 900 mm (36 in.) in all directions from which a person would be able to stand and come in contact with the equipment.~~

~~**(B)** Areas Not Requiring Equipotential Planes.~~

~~Equipotential planes shall not be required for the controlled utilization equipment on the docking facility or floating building supplied by the service equipment or disconnecting means.~~

Statement of Problem and Substantiation for Public Comment

This new revision is so broad that it is without value. How do I establish this plane? A copper, aluminum, or copper-clad conductor? What size? Insulated, covered, or bare? What about small items like moorings or nuts and bolts for the dock that are not going to cause a hazard due to their isolation and extremely low probability of becoming energized? Furthermore, if bonding those items is required, how would we bond them? Are there are any special corrosion protection requirements if the facility is salt water as opposed to fresh?

Related Item

• FR 7925

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 13:05:45 EDT 2021
Committee: NEC-P07

Public Comment No. 1644-NFPA 70-2021 [Section No. 555.15]

~~**555.15** Replacement of Equipment.~~

~~Any modification, replacement, or repair of electrical enclosures, devices, or wiring methods on a docking facility shall be required to comply with the provisions of this *Code* . When modification(s), replacement(s), or repair(s) of electrical enclosures, devices, or wiring methods are necessary on a docking facility, the installation shall require an inspection of the entire circuit. All equipment that has been recognized as being damaged or compromised during the inspection shall be identified, documented, and repaired by a qualified person.~~

~~Informational Note:~~

~~NFPA 303-2021, *Fire Protection Standard for Marinas and Boatyards* , is a resource for guiding the electrical inspection of a marina.~~

Statement of Problem and Substantiation for Public Comment

I think there are problems with telling the AHJ how to do their enforcement job, especially being not all jurisdictions even have inspectors.

Additionally, this well intentioned rule might make facility owners be more likely to not perform critical repairs due to fear that an inspection may expose even more items needing costly repairs.

Subject to state laws, inspectors may already have some limited authority to require upgrades of equipment to meet a new code requirement. In states where inspectors may have such authority (either by clear statute or by untested and weak theories derived from case law) adding specific instances where they can/should require systems to be upgraded could erode that authority they may have, by giving rise to a theory that since the NEC doesn't specifically require these upgrades for non-marina systems, it must not have intended for the AHJ to have whatever authority it may have derived under state law, to require modifications of non-marina systems.

Perhaps a better route with this is to add something to Annex H. For jurisdictions that are concerned, they can be educated on the hazards and can be advised on how to craft their laws and regulatory policies to better protect the public at marinas.

Related Item

• First Revision No. 7926-NFPA 70-2020 [New Section after 555.13]

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 19:45:03 EDT 2021
Committee: NEC-P07

Public Comment No. 516-NFPA 70-2021 [Section No. 555.34(B)(3)]

(3) Portable Power Cables.

(a) Where portable power cables are permitted by 555.34(A)(2), the installation shall comply with the following:

(2) Cables shall be properly supported.

(3) Cables shall be located on the underside of the pier.

(4) Cables shall be securely fastened

~~by nonmetallic clips to~~

(1) by to structural members other than the deck planking.

(2) Cables shall not be installed where subject to physical damage.

(3) Where cables pass through structural members, they shall be protected against chafing by a permanently installed oversized sleeve of nonmetallic material.

(e) Where portable power cables are used as permitted in 555.34(A)(2)(2), there shall be a junction box of corrosion-resistant construction with permanently installed terminal blocks on each pier section to which the feeders and feeder extensions are to be connected. A listed marina power outlet employing terminal blocks/bars shall be permitted in lieu of a junction box. Metal junction boxes and covers, and metal screws and parts that are exposed externally to the boxes, shall be of corrosion-resistant materials or protected by material resistant to corrosion.

Statement of Problem and Substantiation for Public Comment

Nonmetallic clips are not able to support all portable power cables from a structural standpoint.

If the intent to use a nonmetallic material is to ensure no difference in voltage potential in a marina, then metallic structural supports may need to be bonded per 555.13, if they are deemed "likely to become energized".

If the intent is to prevent cable supports from corrosion, specifying a material suited for the environment may be needed like stainless steel, if this isn't beyond scope of the NEC.

Related Item

• PI

Submitter Information Verification

Submitter Full Name: Matt Fann
Organization: United States Coast Guard
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 15:50:31 EDT 2021
Committee: NEC-P07

Public Comment No. 1631-NFPA 70-2021 [Section No. 555.35(E)]

Remove Section 555.35 (E)

~~– Leakage Current Measurement Device.~~

~~Where more than three receptacles supply shore power to boats, a listed leakage current measurement device for use in marina applications shall be available and be used to determine leakage current from each boat that will utilize shore power.~~

~~Informational Note No. 1: Leakage current measurement will provide the capability to determine when an individual boat has defective wiring or other problems contributing to hazardous voltage and current. The use of a test device will allow the facility operator to identify a boat that is creating problems. In some cases a single boat may cause an upstream GFPE device protecting a feeder to operate even though multiple boats are supplied from the same feeder. The use of a test device will help the facility operator prevent a particular boat from contributing to hazardous voltage and current in the marina area.~~

~~Informational Note No. 2: An annual test of each boat with the leakage current measurement device is a prudent step toward determining if a boat has defective wiring that may be contributing hazardous voltage and current. Where the leakage current measurement device reveals that a boat is contributing hazardous voltage and current, repairs should be made to the boat before it is permitted to utilize shore power.~~

~~Exception to (E): Where the shore power equipment includes a leakage indicator and leakage alarm a separate leakage test device shall not be required.~~

~~I would like to first say that I am very much in agreement that leakage current from a boat is a dangerous consideration and should receive the attention of everyone in the marine industry.~~

~~I am concerned that the administration of the 2020 NEC 555.3(E) requirement may be difficult to communicate and implement. Local code enforcement officials do not normally interact with marina management and personnel. Marina management do not typically have access to the NEC.~~

~~The scope of 555.1 covers the installation of wiring and equipment in the areas comprising fixed or floating piers. Not the operational tasks carried out by the marina personnel.~~

~~If the NEC intends to regulate the operations of the marina, we will need to educate the marina operators about the use of a leakage current measurement device and help develop workable solutions to their day to day operations regarding this requirement.~~

~~Boat builders, marine surveyors, marine service organizations and boat owners need to participate along with marina owners and operators in the elimination of the dangers of stray current into the water.~~

Statement of Problem and Substantiation for Public Comment

555.35(E)
I would like to first say that I am very much in agreement that leakage current from a boat is a dangerous consideration and should receive the attention of everyone in the marine industry.
I am concerned that the administration of the 2020 NEC 555.3(E) requirement may be difficult to communicate and implement. Local code enforcement officials do not normally interact with marina management and personnel. Marina management do not typically have access to the NEC.
The scope of 555.1 covers the installation of wiring and equipment in the areas comprising fixed or floating piers. Not the operational tasks carried out by the marina personnel.
If the NEC intends to regulate the operations of the marina, we will need to educate the marina operators about the use of a leakage current measurement device and help develop workable solutions to their day to day operations regarding this requirement.
Boat builders, marine surveyors, marine service organizations and boat owners need to participate along with marina owners and operators in the elimination of the dangers of stray current into the water.

Related Item

• Remove 555.35(E)

Submitter Information Verification

Submitter Full Name: John McDevitt
Organization: Marine Safety/Fire Protection
Affiliation: NFPA 302 Watercraft - Chair
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 17:59:48 EDT 2021
Committee: NEC-P07

Public Comment No. 818-NFPA 70-2021 [Section No. 555.37]

555.37 Equipment Grounding Conductor.

(A) Equipment to Be Connected to Equipment Grounding Conductor.

The following items shall be connected to an equipment grounding conductor run with the circuit conductors in the same raceway, cable, or trench:

(1) Metal boxes, metal cabinets, and all other metal enclosures

(2) Metal frames of utilization equipment

(3) Grounding terminals of grounding-type receptacles

(B) Type of Equipment Grounding Conductor.

An equipment grounding conductor shall be of the wire-type, insulated, and sized in accordance with 250.122 but not smaller than 12 AWG.

(C) Feeder Equipment Grounding Conductor.

Where a feeder supplies a remote panelboard or other distribution equipment, an insulated equipment grounding conductor shall extend from a grounding terminal in the service to a grounding terminal and busbar in the remote panelboard or other distribution equipment.

(D) Branch-Circuit Equipment Grounding Conductor.

The insulated equipment grounding conductor for branch circuits shall terminate at a grounding terminal in a remote panelboard, in other distribution equipment, or in the main service equipment.

(E) Cord-and-Plug-Connected Appliances.

Unless double-insulated, cord-and-plug-connected appliances shall be grounded by means of an equipment grounding conductor in the cord and a grounding-type attachment plug.

Exception: An equipment grounding conductor shall be permitted to be uninsulated if a part of a listed cable assembly identified for the environment and not subject to atmospheres or environments such as, but not limited to, storm water basins, sewage treatment ponds, and natural bodies of water containing salt water.

Additional Proposed Changes

File Name	Description	Approved
7_CN_333.pdf	7 CN333	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 333 appeared in the First Draft Report on First Revision No. 8169.

The Correlating Committee directs the Panel to review 555.37 (A) for compliance with Section 4.1.1 of the Style Manual. NEC 555.37 (A) does not appear to supplement or modify the requirements in Article 250.

Related Item

• First Revision No. 8169

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 12:30:24 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 333-NFPA 70-2021 [Section No. 555.37]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:24:03 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to review 555.37 (A) for compliance with Section 4.1.1 of the Style Manual. NEC 555.37 (A) does not appear to supplement or modify the requirements in Article 250.

First Revision No. 8169-NFPA 70-2020 [Section No. 555.37]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1549-NFPA 70-2021 [Section No. 555.38]

555.38 Luminaires.

(A) General.

~~All luminaires and retrofit kits shall be listed and identified for use in their intended environment.~~ Luminaires and their supply connections shall be secured to structural elements of the marina to limit damage from watercraft and prevent entanglement of and interaction with sea life.

(B) Underwater Luminaires.

Luminaires installed below the highest high tide level or electrical datum plane and likely to be periodically submersed shall be limited to those identified as submersible or that operate below the low-voltage contact limit defined in Article 100 and be supplied by an isolating transformer or power supply in accordance with 680.23(A)(2).

Statement of Problem and Substantiation for Public Comment

(A) In accordance with 90.3, sections 110.3(B) and 410.6 already require luminaires to be listed and identified for their intended use, therefore, this language is not necessary in 555.38(A).

(B) Some luminaires are constructed to prevent the ingress of water when submersed and should be allowed for use in this application.

Related Item

• FR 7931/PI 852

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 13:17:37 EDT 2021
Committee: NEC-P07

Public Comment No. 1923-NFPA 70-2021 [Section No. 555.53]

555.53 Ground-Fault Protection.

The main overcurrent protective device that feeds the floating building shall have ground-fault protection not exceeding 100 mA. Ground-fault protection of each individual branch or feeder circuit shall be permitted as a suitable alternative. Outdoor outlets, shore power outlets, and boat hoists located at floating buildings shall comply with 555.35(C) and (D).

Exception: A floating building in full compliance with 555.13 and moored at an ocean waterfront shall not be required to have ground-fault protection .

Statement of Problem and Substantiation for Public Comment

The panel response was not really responsive. Ocean is ocean. And the Boston Aquarium, a huge building moored in the Atlantic Ocean off Boston, is not under any conceivable scenario going to be the source of an ESD event, and it is also completely ludicrous to even imagine the literal text of the NEC could be complied with. Presumably the Massachusetts Electrical Code will insert this language in order to prevent issues, but CMP 7 should look closely at this now.

Related Item

• PI-4238

Submitter Information Verification

Submitter Full Name: Frederic Hartwell
Organization: Hartwell Electrical Services, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 16:35:39 EDT 2021
Committee: NEC-P07

Public Comment No. 1776-NFPA 70-2021 [Section No. 604.7]

604.7 Installation.

Manufactured wiring systems shall be secured and supported in accordance with the applicable cable or conduit article for the cable or conduit type employed.

Exception: Branch circuits and taps of manufactured wiring systems, not exceeding a rating of 30 amperes and employing Type AC cable, interlocked armor Type MC cable, FMC, LFMC, or LFNC, shall be permitted to be installed without securement within listed low-profile fixed height access flooring systems having a maximum height above the floor surface of 150 mm (6 in.) where those cables or flexible conduits are protected against physical damage by weight-load-rated wiring channel covers or access plates.

Informational Note No. 1: “Low-profile fixed height access flooring systems” and associated “wiring channels” are sometimes known as “reticulated grid-form cable trench systems” and as “cable trenches”, respectively. “Low-profile fixed height access flooring systems” and “reticulated grid-form cable trench systems” are not considered to be “raised floors” as in 645.5(E) and are not considered to be “ducts” or “other spaces for environmental air (plenums)” as in 300.22(D).

Statement of Problem and Substantiation for Public Comment

TECHNICAL SUBSTANTIATION:

Low profile access floors have been in the market for over 25 years and have been successfully installed without incident during this time. In 2009 CSI recognized this category of floor when they separated traditional raised access floors from these low-profile systems. More and more companies are designing with low profile access floors. The modern built environment must adapt to ever changing technological evolution. The low-profile flooring severely limits the space available for other trades to put systems into the floor. The cavities and wiring channels are so small as to render the space unusable for anything but wiring that is being installed by trained electricians, be they trained for power wiring or for communications systems. IN BOTH CASES, THESE ARE QUALIFIED ELECTRICIANS.

These systems create separate segregated cable ways. There are hundreds of available pathways. In a typical office only about 5% of the available pathways are used. There is abundant room to add power and data/comm wiring in the future without disturbing existing wiring.

There is no pulling and fishing as all changes and adds are done by opening the floor system and LAYING new wiring in. This is a much more deliberate installation methodology than pulling or fishing cables in. Safe practices are easier than in a traditional raised floor.

The feeders ARE FULLY SUPPORTED AND SECURED, as are the branch circuit and tap conductors that are larger than 30-amps.

The tap-off whips and branch circuit wiring methods are fully SUPPORTED by the structural floor.

The flooring system has passed seismic testing, including a test to determine if wiring would be damaged in the wiring channels during a seismic event. From the attached report:

“Electrical functionality testing on representative wiring was performed to ensure no damage was caused to internal wires. In addition, a power/voice/data box installed during each test run and checked for functionality after completion of all testing.”

As these manufactured wiring systems are DESIGNED AND INTENDED to be relocatable, securing the tap-off and branch circuit wiring methods makes this task cumbersome without adding to the safety of the installation. Changes are typically made when the end user undergoes an alteration of office furniture layout. The channels within the flooring system are not an area where any regular or ongoing maintenance and/or service work is performed.

These manufactured wiring systems are altered only after years of service in place where they operate undisturbed.

The wiring is fully SUPPORTED within the floor channels as it is laying on the structural floor. This is very similar to a situation in which wiring methods are fished into building cavities. The securement of these cables and conduits does not add to the safety of the installation but it does hinder one of the features of a relocatable manufactured wiring system.

The ceiling is where all the other trades are. In the case of AC, MC, FMC, LFMC, & LFNC, all these wiring methods are permitted to be unsupported for six feet in dropped ceilings when they are installed to supply luminaires. These floating wiring methods are subject to being damaged and disturbed by any tradesperson who works in that ceiling. In the case of low-profile fixed height access flooring, only the electrical trade (power electricians and communications electricians) works in the space beneath the floor, and the wiring method is laying in channels under the floor and not floating through a space that has plumbing, ductwork, ceiling hanger wire, sprinkler piping, etc.

The wiring within a low-profile fixed height access floor is not subject to nearly the same likelihood of being damaged as the wiring within a ceiling cavity is.

In a fixed height low-profile access floor, no one is trying to install or repair long lengths of piping or ductwork.

No one is servicing HVAC equipment, VAV boxes, condensate pumps, sprinkler systems, etc.

There is no regular maintenance work that occurs in the floor channels. When intentional changes are contemplated, that is the only time that access to the space within the low-profile floor is needed. There are no random entries into the floor cavity by other trades. The floor is

only accessed by qualified electricians and low voltage installers (also electricians) when a specific power, data or A/V need arises.

Because only the electrical trade accesses the space and because those tradespeople are SPECIFICALLY TRAINED IN THE NEC AND ITS REQUIREMENTS, the chance of the wiring method being damaged is so small as to be nonexistent.

OTHER TRADES:

The installers of telephone and data wiring are not OTHER TRADES. These are electricians and technicians who are bound by the National Electrical Code, must install their wiring systems as per the rules therein, and are SPECIFICALLY TRAINED IN THE PROPER INSTALLATION OF WIRING METHODS. If an electrician is trained to properly install data wiring which is much less robust than the wiring methods used for power and lighting, then it is extremely unlikely that they would have a detrimental impact on the existing wiring within the low-profile fixed height access flooring. If this installation were subject to being damaged by other trades such as plumbers, carpenters, etc., such as in the cavity above a dropped ceiling, then it is possible that there would be a concern about damage. This is not the case with qualified electricians installing data wiring. Coupled with the fact that any new cables are installed by being LAYED into the floor, not pulled or fished, the possibility of damage is reduced even more.

It should also be noted that once the data/comm backbone wiring is installed within the floor channels, it is a very rare occurrence for additional cables to be required and installed. Should such a need arise, the installation of one to ten additional CAT6 cables would not subject the power wiring to any appreciable chance of damage. The new cables are simply LAID INTO THE CHANNELS and then terminated at the floor boxes or system furniture.

PROPRIETARY FLOOR SYSTEM:

This public input DOES NOT seek special rules for a proprietary floor system. Low-profile fixed height access flooring is manufactured and installed by many companies. A sample list of these companies is provided below along with web sites where their products and wire management systems can be viewed. While the public input provided examples and specifications from one manufacturer, it was not the intent of the submitter to imply that the proposed language would apply to a single company's proprietary floor system. The proposed language would apply to all low-profile fixed height access flooring systems. Examples are provided from a single manufacturer only because this is the proprietary data that is available to the submitter. The proposed code language is not, however, in any way specific to a single product but generic in nature and WOULD APPLY TO ALL low-profile access floors.

A SAMPLE OF WEB SITES OF COMPANIES THAT MANUFACTURE
LOW-PROFILE FIXED HEIGHT ACCESS FLOOR

ASM Products – https://www.asmproducts.com/en-us/international-products/international-sales/commercial-flooring/ultra-low-fixed-height-wire-management-system

Access Floor Systems – https://www.accessfloorsystems.com/index.php/products/raised-floor-kits/netfloor-usa-low-profile-access-floor-kit/netfloor-eco-low-profile-access-floor-kit.html

Corporate Interiors – https://www.corporate-interiors.com/product/steelcase-low-profile-floor/

Net Floor USA – https://www.netfloorusa.com/low-profile-cable-management-access-floor-vs-traditional-access-floor

Titan Flor – https://www.titanflor.com/products/low-profile-raised-floor/

FreeAxez Product - https://www.freeaxez.com/gridd/

Related Item

• PI 460

Submitter Information Verification

Submitter Full Name: Earl Geertgens
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City:
State:
Zip:
Submittal Date: Tue Aug 17 18:14:37 EDT 2021
Committee: NEC-P07

Public Comment No. 769-NFPA 70-2021 [Section No. 604.100]

604.100 Construction.

(A) Cable or Conduit Types.

(1) Cables.

Cable shall be listed Type AC cable or listed Type MC cable containing nominal 600-volt, 8 AWG to 12 AWG insulated copper-clad aluminum or copper conductors.

Other cables as listed in 725.154, 800.113, and 830.179 shall be permitted in manufactured wiring systems for wiring of equipment within the scope of their respective articles.

(2) Conduits.

Conduit shall be listed flexible metal conduit, listed liquidtight flexible conduit, or electrical metallic tubing (EMT) containing nominal 600-volt, 8 AWG to 12 AWG insulated copper-clad aluminum or copper conductors with a bare or insulated copper-clad aluminum or copper equipment grounding conductor equivalent in size to the ungrounded conductor.

Exception No. 1 to (1) and (2): A luminaire tap, no longer than 1.8 m (6 ft) and intended for connection to a single luminaire, shall be permitted to contain conductors smaller than 12 AWG but not smaller than 18 AWG.

Exception No. 2 to (1) and (2): Listed manufactured wiring assemblies containing conductors smaller than 12 AWG shall be permitted for remote-control, signaling, or communications circuits.

Exception No. 3 to (2): Listed manufactured wiring systems containing unlisted flexible metal conduit of noncircular cross section or trade sizes smaller than permitted by 348.20(A), or both, shall be permitted where the wiring systems are supplied with fittings and conductors at the time of manufacture.

(3) Flexible Cord.

Flexible cord suitable for hard usage, with minimum 12 AWG conductors, shall be permitted as part of a listed factory-made assembly not exceeding 1.8 m (6 ft) in length when making a transition between components of a manufactured wiring system and utilization equipment not permanently secured to the building structure. The cord shall be visible for the entire length, shall not be subject to physical damage, and shall be provided with identified strain relief.

Exception: Listed electric-discharge luminaires that comply with 410.62(C) shall be permitted with conductors smaller than 12 AWG.

(4) Busways.

Busways shall be listed continuous plug-in type containing factory-mounted, bare or insulated conductors, which shall be copper or aluminum bars, rods, or tubes. The busway shall be provided with an equipment ground. The busway shall be rated nominal 600 volts, 20, 30, or 40 amperes. Busways shall be installed in accordance with 368.12, 368.17(D), and 368.30.

(5) Raceway.

Prewired, modular, surface-mounted raceways shall be listed for the use, rated nominal 600 volts, 20 amperes, and installed in accordance with 386.12, 386.30, 386.60, and 386.100.

(B) Marking.

Each section shall be marked to identify the type of cable, flexible cord, or conduit.

(C) Receptacles and Connectors.

Receptacles and connectors shall be of the locking type, uniquely polarized and identified for the purpose, and shall be part of a listed assembly for the appropriate system. All connector openings shall be designed to prevent inadvertent contact with live parts or capped to effectively close the connector openings.

(D) Other Component Parts.

Other component parts shall be listed for the appropriate system.

Additional Proposed Changes

File Name	Description	Approved
7_CN_317_Detail.pdf	7 CN317	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 317 appeared in the First Draft Report on First Revision No. 7745.

The Correlating Committee directs the panel to review the title and text in 604.100 to consider revising "Conduit" to "Conduits and Tubing" to establish correlation with Chapter 3.

Related Item

• First Revision No. 7745

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 10:12:12 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 317-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 15:40:38 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the panel to review the title and text in 604.100 to consider revising "Conduit" to "Conduits and Tubing" to establish correlation with Chapter 3.

First Revision No. 7745-NFPA 70-2020 [Detail]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 56-NFPA 70-2021 [Section No. 604.100(A)(2)]

(2) Conduits.

Conduit shall be listed flexible metal conduit (FMC) , listed liquidtight flexible metal conduit (LFMC) , liquidtight flexible nonmetallic conduit (LFNC), or electrical metallic tubing (EMT) containing nominal 600-volt, 8 AWG to 12 AWG insulated copper-clad aluminum or copper conductors with a bare or insulated copper-clad aluminum or copper equipment grounding conductor equivalent in size to the ungrounded conductor.

Exception No. 1 to (1) and (2): A luminaire tap, no longer than 1.8 m (6 ft) and intended for connection to a single luminaire, shall be permitted to contain conductors smaller than 12 AWG but not smaller than 18 AWG.

Exception No. 2 to (1) and (2): Listed manufactured wiring assemblies containing conductors smaller than 12 AWG shall be permitted for remote-control, signaling, or communications circuits.

Exception No. 3 to (2): Listed manufactured wiring systems containing unlisted flexible metal conduit of noncircular cross section or trade sizes smaller than permitted by 348.20(A), or both, shall be permitted where the wiring systems are supplied with fittings and conductors at the time of manufacture.

Statement of Problem and Substantiation for Public Comment

Editorial clarification for usability. "Liquidtight flexible conduit" was expanded to indicate the two types of liquidtight flexible conduits that are permitted by the code. Acronyms were added for clarity.

Related Item

• FR 7714

Submitter Information Verification

Submitter Full Name: David Kendall
Organization: ABB Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 01 09:41:19 EDT 2021
Committee: NEC-P07

Public Comment No. 819-NFPA 70-2021 [Section No. 604.100(A)(2)]

(2) Conduits.

Conduit shall be listed flexible metal conduit, listed liquidtight flexible conduit, or electrical metallic tubing (EMT) containing nominal 600-volt, 8 AWG to 12 AWG insulated copper-clad aluminum or copper conductors with a bare or insulated copper-clad aluminum or copper equipment grounding conductor equivalent in size to the ungrounded conductor.

Exception No. 1 to (1) and (2): A luminaire tap, no longer than 1.8 m (6 ft) and intended for connection to a single luminaire, shall be permitted to contain conductors smaller than 12 AWG but not smaller than 18 AWG.

Exception No. 2 to (1) and (2): Listed manufactured wiring assemblies containing conductors smaller than 12 AWG shall be permitted for remote-control, signaling, or communications circuits.

Exception No. 3 to (2): Listed manufactured wiring systems containing unlisted flexible metal conduit of noncircular cross section or trade sizes smaller than permitted by 348.20(A), or both, shall be permitted where the wiring systems are supplied with fittings and conductors at the time of manufacture.

Additional Proposed Changes

File Name	Description	Approved
7_CN_334.pdf	7 CN334	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 334 appeared in the First Draft Report on First Revision No. 7714.

The Correlating Committee directs the Panel to correlate the title of 604.100 (A) (2) to the list of wiring methods included (Conduit and Tubing).

Related Item

• First Revision No. 7714

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 12:32:25 EDT 2021
Committee: NEC-P07

Correlating Committee Note No. 334-NFPA 70-2021 [Section No. 604.100(A)(2)]

Submitter Information Verification

Committee: NEC-P07
Submittal Date: Thu May 06 16:28:00 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to correlate the title of 604.100 (A) (2) to the list of wiring methods included (Conduit and Tubing).

First Revision No. 7714-NFPA 70-2020 [Section No. 604.100(A)(2)]

Ballot Results

This item has passed ballot

12 Eligible Voters
0 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1639-NFPA 70-2021 [Section No. 604.100(A)(3)]

(3) Flexible Cord.

Flexible cord suitable for hard usage, with minimum 12 AWG conductors, shall be permitted as part of a listed factory-made assembly not exceeding 1.8 m (6 ft) in length when making a transition between components of a manufactured wiring system and utilization equipment not permanently secured to the building structure. The cord shall be ~~visible for the entire length, shall not be subject to physical damage, and shall be~~ provided with identified strain relief.

Exception: Listed electric-discharge luminaires that comply with 410.62(C) shall be permitted with conductors smaller than 12 AWG.

Statement of Problem and Substantiation for Public Comment

I am glad that the committee agreed with me in their committee statement. This is not a construction requirement, it is an installation requirement. It does not belong in 604.100 which is titled CONSTRUCTION.

Related Item

• PI 3725

Submitter Information Verification

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Submittal Date: Mon Aug 16 18:55:25 EDT 2021
Committee: NEC-P07

Public Comment No. 417-NFPA 70-2021 [New Section after 675.17]

TITLE OF NEW CONTENT

675.18 Cybersecurity, Cyberweapon, Electromagnetic Pulse (EMP), Geomagnetic Disturbance (GMD), and Intentional Electromagnetic Interference (IEMI) Protection. Electrically driven or controlled irrigation machines shall comply with either of the following:

(1) The system shall be identified for cybersecurity, cyberweapon, EMP, GMD, and IEMI protection.

(2) A cybersecurity, cyberweapon, EMP, GMD, and IEMI protection failure modes effects analysis assessment shall be conducted to determine system vulnerabilities.

The identification or assessment shall be reviewed when the system configuration changes and at not more than 5-year intervals. Documentation of the identification or assessment shall be made available to those authorized to inspect, operate, and maintain the system.

Statement of Problem and Substantiation for Public Comment

This Public Comment is a follow-up to PI 761, PI 3080, FR 8801, PI 759, and PI 4024. It does not require cybersecurity, cyberweapon, EMP, GMD, or IEMI protection, but rather calls for the electrically driven or controlled irrigation machine to be identified for these threats or for a threat assessment to be completed. While the NEC® is not ready to mandate protection requirements, an assessment would show machine vulnerabilities. Acceptance of this Public Comment would at least bring the subject to the attention of owners, design engineers, electrical inspectors, and insurance companies, and set the table for requirements in future editions of the NEC® (or other NFPA standards). The format for this Public Comment is based upon the cybersecurity requirements found in FR 8801, which offers an assessment as an alternate for requiring protection.

PI 761 provided technical substantiation to require Electromagnetic Pulse (EMP) Protection for our critical infrastructure. While it appears that the NEC(R) is not ready to actually require EMP protection at this time, the security of our country is at stake. An EMP is fairly well understood as an extremely powerful electromagnetic wave that can impress 50,000 volts per meter on every piece of electrical equipment, destroying everything that is unprotected. An EMP is often associated with a nuclear explosion, but that is not the only cause of electromagnetic damage. A Geomagnetic Disturbance (GMD) is caused by a sunspot. While the EMP would be created by one of our adversaries, the sun spot is an act of God. These types of events can instantly initiate millions of fires in our unprotected electrical systems, overwhelming our fire-fighting capabilities. If millions of fires weren't bad enough, the unprotected electrical equipment would be damaged or completely destroyed, subjecting the country to years of blackout. Government intelligence studies, now unclassified, have predicted that from 66% to 90% of our population would die within one year, due to a lack of food, clean water, and medicine, if a significant EMP or GMD were to occur, while the country's electrical infrastructure remains unprotected. The final threat listed is an Intentional Electromagnetic Interference (IEMI). It is easily created by utilizing off-the-shelf parts, available for purchase on the internet, that will fit into a van. While much less powerful than a significant EMP or GMD, twenty vans, equipped with bench-made IEMI devices and scattered throughout the country, can shut down major industries and major parts of the country for weeks, if not months, through a coordinated attack, similar to 9/11, by targeting key industries/vulnerabilities. In conclusion, these electromagnetic threats to our unprotected electrical infrastructure, and therefor to our entire country, are absolutely real, and must be addressed.

PI 4024 provided significant substantiation for the need to protect critical infrastructure against cyber attack for equipment connected to the internet. However, equipment does not need to be connected to the internet in order to be damaged or destroyed by cyber threats. Equipment can be damaged by cyber weapons such as malicious computer worms that attack SCADA (control) systems. A great example is the Stuxnet worm that destroyed the centrifuges in Iran. Thus, this Public Comment deletes the PI 4024 reference to the internet and adds cyberweapon to the list of threats that need to be either protected against or assessed.

Related Item

• PI 759 • PI 3080 • FR 8801 • PI 4024 • PI 3055 • FR 7947 • PI 4026 • FR 8880 • FR 8917 • PI 2888 • PI 3083 • FR 8914

Submitter Information Verification

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Committee: NEC-P07

Public Comment No. 438-NFPA 70-2021 [Global Input]

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-3) appointed by the Correlating Committee. This task group consisted Mike Stone (CMP-1), Dean Hunter (CMP-7), John Kovacik (CMP-12), Don Ankele (CMP-14), Chad Beebe (CMP-15), Mike Querry (CMP-17) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual." Definitions TG-3 was requested by the corelating committee to review the following definitions:

Alternating-Current Power Distribution Box (530) (CMP-15)

Appliance (CMP-17)

Appliance, Fixed (CMP-7)

Appliance, Portable (CMP-7)

Equipment. (CMP-1)

Equipment, Portable (640) (CMP-12)

Equipment, Signal (620) (CMP-12)

Fastened-In-Place (CMP-12)

Fixed. (680) (CMP-17)

Fixed-In-Place (CMP-12)

Mobile Equipment (CMP-14)

Portable (625) (CMP-12); (680) (CMP-17); (660) (CMP-12)

Portable Equipment. (CMP-14-15-17)

Portable Power Distribution Unit. (CMP-15)

Portable Structures (CMP-15)

Temporary Equipment (CMP-12)

Utilization Equipment (CMP-1)

The definitions TG-3 makes the following recommendations:

Alternating-Current Power Distribution Box (530) (CMP-15)

The definition for Alternating-Current Power Distribution Box can be deleted

Substantiation - the definition for Portable Power Distribution Unit will work for both.

Appliance.

Utilization equipment that is fastened in place, stationary or portable, typically generally other than industrial, that is normally built in standardized sizes or types and is installed or connected as a unit to perform one or more functions such as clothes washing, air-conditioning, food mixing, deep frying, and so forth. (CMP-17)

Appliance, Fixed (CMP-7)

Delete the definition (appliance, fixed)

Substantiation - appliance is defined and the definition for fixed will be further defined.

Appliance, Portable (CMP-7)

Delete the definition (appliance, portable)

Substantiation - appliance is defined and the defintion for portable will be further defined.

Equipment.

A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation. (CMP-1)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC.

Equipment, Portable (640) (CMP-12)

Delete this definition as a new definition for Portable Equipment is being proposed.

~~Signal~~Equipment, Signal. (Signal Equipment)

Includes audible and visual equipment such as chimes, gongs, lights, and displays that convey information to the user. (620) (CMP-12)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC with the minor edits proposed to comply with the style manual.

Fastened in Place.

Mounting means of equipment in which the fastening means are specifically designed to permit ~~periodic~~ removal~~,~~ without the use of a tool~~, for relocation, interchangeability, maintenance, or repair~~.(625) (CMP-12)

Substantiation - The proposed 2023 definition would be revised to correlate with the proposed definitions for portable and mobile.

Fixed. (680) (CMP-17).

Equipment, Fixed (as applied to equipment) (Fixed Equipment).

Delete the 2023 proposed definition utilize the Fixed-in-Place definition.

Equipment, Fixed-In-Place (Fixed Equipment)

Equipment in a specific location where the mounting or fastening means requires a tool for removal.

Substantiation - The proposed TG-3 defintion would replace the propose 2023 definition

Equipment, Mobile (Mobile Equipment).

Equipment with electrical components that is suitable to be moved only with mechanical aids or is provided with wheels for movement by a person(s) or powered devices. (513) (CMP-14)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Portable (660) (CMP-12)

Equipment, Portable (as applied to nonmedical Xray equipment) (Portable Equipment). (660) (CMP-12)

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Portable

A device that is designed to be hand-carried from location to location, or easily transported without the use of other devices or equipment.

Substantiation - The proposed TG-3 defintion for "Portable" would replace the proposed 2023 definitions for Portable (660) (CMP-12)and Portable (as applied to nonmedical Xray equipment)

Equipment, Portable (As applied to Hazrdous Locations) (Portable Equipment).

Equipment with electrical components suitable to be moved by a single person without mechanical aids. (511) (CMP-14)

Substantiation - The proposed TG-3 definition for**"**Portable Equipment (As applied to Hazrdous Locations)" would replace the proposed 2023 definition to correlate with the proposed TG-3 definition for "Portable Equipment"

Portable Equipment.(520) (CMP-15)

Delete

Portable Equipment.(530) (CMP-15)

Delete

Portable (as applied to equipment). (680) (CMP-17)

Delete

Equipment, Portable (Portable Equipment).

Equipment intended to be moved from one location to another.

Substantiation - The proposed TG-3 definition for**"**Portable Equipment" would combine the definitions for "Portable equipment" for Articles 520, 530 and 680 into one common definition.

Portable Power Distribution Unit.

A power distribution box containing receptacles and overcurrent devices. (520) (CMP-15)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Portable Structures.

Units designed to be moved including, but not limited to, amusement rides, attractions, concessions, tents, trailers, trucks, and similar units. (525) (CMP-15)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Equipment, Temporary Equipment (Temporary Equipment).

Portable wiring and equipment intended for use with events of a transient or temporary nature where all equipment is presumed to be removed at the conclusion of the event. (640) (CMP-12)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Equipment, Utilization (Utilization Equipment).

Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes. (CMP-1)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-3) appointed by the Correlating Committee. This task group consisted Mike Stone (CMP-1), Dean Hunter (CMP-7), John Kovacik (CMP-12), Don Ankele (CMP-14), Chad Beebe (CMP-15), Mike Querry (CMP-17) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual." Definitions TG-3 was requested by the corelating committee to review the following definitions:

Alternating-Current Power Distribution Box (530) (CMP-15)
Appliance (CMP-17)
Appliance, Fixed (CMP-7)
Appliance, Portable (CMP-7)
Equipment. (CMP-1)
Equipment, Portable (640) (CMP-12)
Equipment, Signal (620) (CMP-12)
Fastened-In-Place (CMP-12)
Fixed. (680) (CMP-17)
Fixed-In-Place (CMP-12)
Mobile Equipment (CMP-14)
Portable (625) (CMP-12); (680) (CMP-17); (660) (CMP-12)
Portable Equipment. (CMP-14-15-17)
Portable Power Distribution Unit. (CMP-15)
Portable Structures (CMP-15)
Temporary Equipment (CMP-12)
Utilization Equipment (CMP-1)

Related Item

• FR 9274 (Global Input)

Submitter Information Verification

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Submittal Date: Tue Jul 27 15:30:28 EDT 2021
Committee: NEC-P17

By checking this box I affirm that I am Dennis Querry, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature

Public Comment No. 462-NFPA 70-2021 [Global Input]

Corrosive Environment (As applied to Swimming Pools, Fountains, and Similar Installations). Areas or enclosures without ~~adequate~~ ventilation, where electrical equipment is located and pool sanitation chemicals are stored, handled, or dispensed. (680) (CMP-17).

Informational Note No 1.: See Advisory: Swimming Pool Chemical: Chlorine, OSWER 90- 008.1, June 1990, available from the EPA National Service Center for Environmental Publications (NSCEP) as sanitation chemicals and pool water are considered to pose a risk of corrosion (gradual damage or destruction of materials) due to the presence of oxidizers (e.g., calcium

hypochlorite, sodium hypochlorite, bromine, chlorinated isocyanurates) and chlorinating agents that release chlorine when dissolved in water.

Informational Note No. 2: See ANSI/APSP-11, Standard for Water Quality in Public Pools and Spas, ANSI/ASHRAE 62.1, Table 6-4 Minimum Exhaust Rates, and Section 324 of the 2021 International Swimming Pool and Spa Code (ISPSC), including associated definitions and requirements concerning adequate ventilation of indoor spaces such as equipment and chemical

storage rooms, which can reduce the likelihood of the accumulation of corrosive vapors. Chemicals such as chlorine cause severe corrosive and deteriorating effects on electrical connections, equipment, and enclosures when stored and kept in the same vicinity. (680) (CMP-17)

Luminaire, Cord-and-Plug-Connected. (Cord-and-Plug-Connected Luminaire). A

lighting assembly ~~consisting of a luminaire~~ intended for installation in the wall of a spa, hot tub, or storable pool, including a cord-and-plug-connected transformer. (680) (CMP-17)

Luminaire, Through-Wall (Through-Wall Luminaire). A lighting assembly intended for installation above grade, on or through the wall of a pool, consisting of twointerconnectedgroups of components separated by the pool wall. (680) (CMP- 17)

Resistance Heating Element. A specific separate element to generate heat that is externally attached to, embedded in, integrated with, or internal to the object to be heated.

Pool, Storable; used for Swimming, Wading or Immersion, Storable (Storable Swimming Wading or Immersion Pool). Swimming, wading or immersion pools installed entirely on or above the ground that are intended to be stored when not is use and are designed for ease of relocation. (680) (CMP-17)

Informational Note: Historically, a 1.07 m (42 in.) wall height accommodated most storable

swimming pools. Modern manufacturing methods have allowed storable pool manufacturers to increase wall heights while still permitting ease of assembly and disassembly of the pool.

Spa and Hot Tub, Storable. Spas and hot tubs installed entirely on or above the ground that are intended to be stored when not is use and are designed for ease of relocation. (680) (CMP-17)

Bodies of Water, Artificially Made (Artificially Made Bodies of Water). Bodies of water that have been constructed or modified to fit some decorative or commercial purpose such as, but not limited to, aeration ponds, fish farm ponds, storm retention basins, treatment ponds, and irrigation (channel) facilities. Water depths may vary seasonally or be controlled. (682) (CMP-17)

Bodies of Water, Natural (Natural Bodies of Water). Bodies of water such as lakes, streams, ponds, rivers, and other naturally occurring bodies of water, which may vary in depth throughout the year. (682) (CMP-17)

Electrically Powered Pool Lift. A fabricated unit that provides accessibility to and from a pool or spa for people with disabilities. (680) (CMP-17)

Type your content here ...

Statement of Problem and Substantiation for Public Comment

CMP 17 Definitions Task Group proposes the modifications to comply with FR9274

Corrosive Environment — Swimming Pools, Fountains, and Similar Installations
The Correlating Committee directs that the definition of the term “corrosive environment” include parenthetical text (as applied to swimming pools, fountains, and similar installations). The use of “adequate ventilation” is vague and unenforceable requirement in a definition.
The Correlating Committee directs CMP 17 to provide clarity on what is meant by “adequate ventilation” as used in the definition.
2.2.2.3 Base Term
2.2.2.3.2 Article Number
EPA Chemical Emergency Preparedness and Prevention Advisory SWIMMING POOL CHEMICALS: Chlorine

CMP 17 Substantiation - The definition of Corrosive Environment is revised to comply with the NEC Style Manual. The definition has the parenthetical text added, and the term “adequate” as applied to ventilation has been removed as this is considered a vague and unenforceable term.

Lighting Assembly, Cord-and-Plug-Connected. (Cord-and-Plug-Connected Lighting Assembly

The Correlating Committee directs the panel to consider the term luminaire instead of lighting assembly for correlation of the document

CMP 17 Substantiation - The definition for “Lighting Assembly, Cord-and-Plug-Connected” was revised to provide additional clarity, and to utilize the term “luminaire” instead of “lighting assembly”. This is also consistent with the UL Marking Guide for Swimming Pool Equipment, Spas, Fountains and Hydromassage Bathtubs which utilizes the term “luminaire”.

Lighting Assembly, Through-Wall (Through-Wall Lighting Assembly).

The Correlating Committee directs the panel to consider the term luminaire instead of lighting assembly for correlation of the document.

CMP 17 Substantiation - The definition for “Lighting Assembly, Cord-and-Plug-Connected” was revised to provide additional clarity by utilizing the term “luminaire” instead of “lighting assembly”. This is also consistent with the UL Marking Guide for Swimming Pool Equipment, Spas, Fountains and Hydromassage Bathtubs which utilizes the term “luminaire”.

Resistance Heating Element.

The Correlating Committee directs the panel review and reconsider the wording of this definition relative to use of the word “may” as provided in Sections 3.1.1 and 3.2.1 of the NEC Style Manual.

CMP 17 Substantiation - The definition of Resistance Heating Element is revised to comply with the NEC Style Manual. The term “may” has been removed as this is considered a vague and unenforceable term.

Storable Swimming, Wading, or Immersion Pools; and Storable/Portable Spas and Hot Tubs.

Defined alternate terms shall be shown in accordance with 2.2.2.5 of the Style Manual. The Correlating Committee notes that "storable swimming, wading, or immersion pools" is not used in the document other than the title of Part III. This term might also be better grouped with pools as the base term so it is easy to locate the definition, in accordance with 2.2.2.3.

The Correlating Committee directs that CMP17 to review the use of the word “fully” in the context of the definition for clarity and usability. Ballot comments identified that the revised definition is missing two words. Add "and are" before "designed for ease of relocation." in the definition. The Correlating Committee directs that CMP-17 the wording in FR – 8413 be reviewed for and revised as determined necessary for clarity and ease of applying the requirement.

2.2.2.3 Base Term.
Group by Pool Pool, Storable. (Storable Pool)
2.2.2.5 Alternate Term

CMP 17 substantiation - For clarity the original definition was split into two definitions: one specific to storable pools and the other specific to storable spas and hot tubs.

The word “fully” has been replaced by “entirely” for clarification. “Entirely on” vs “entirely above” is a necessary distinction because storable spas and pools are often placed on elevated decks which may be multiple stories above the ground, and therefore are not “entirely on” the ground. Further, some pools and spas are partially buried in the ground and therefore are not considered storable under those conditions.

Also, added “and are” before “designed for ease of relocation” which improves clarity.

Artificially Made Bodies of Water.

2.2.2.3 Base Term
(Group by Bodies of Water)

CMP 17 substantiation - The definition is revised to comply with 2.2.2.3 of the NEC Style Manual, by using the base term “Bodies of Water” at start of the defined term, and adding parenthetical text with alternate terms.

Natural Bodies of Water.

2.2.2.3 Base Term
(Group by Bodies of Water)

CMP 17 substantiation - The definition is revised to comply with 2.2.2.3 of the NEC Style Manual, by using the base term “Bodies of Water” at start of the defined term, and adding parenthetical text with alternate terms.

Electrically Powered Pool Lift

2.2.2.2. Term in Definition

CMP 17 substantiation - The definition is revised to comply with 2.2.2.2 of the NEC Style Manual, by removing the word “lift” in the definition, as “lift” is part of the term being defined.

Related Item

• 9274

Submitter Information Verification

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Submittal Date: Tue Jul 27 18:12:34 EDT 2021
Committee: NEC-P17

Public Comment No. 556-NFPA 70-2021 [New Definition after Definition: Ground-Fault Circuit Inter...]

Ground-Fault Circuit Interrupter, Special Purpose (SPGFCI).

A device intended for the detection of ground-fault currents that functions to de-energize a circuit or portion of a circuit within an established period of time when a current to ground exceeds the values established for Class C, D, and E devices.

Informational Note: See UL 943C, Outline of Investigation for Special Purpose Ground-Fault Circuit Interrupters, for information on classes C, D, and E Special Purpose Ground-Fault Circuit Interrupters.

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of a Correlating Committee task group established to review the term Ground-Fault Circuit Interrupter and other terminology associated with ground-fault protective equipment throughout the NEC to ensure consistency with how these are defined in Article 100. The Task Group consisted of members of CMP 2, 7, 10 and 17. Task group members include the following: Thomas Domitrovich, Robert Osborne, Keith Lofland, Danish Zia, Kevin Arnold, Marcelo Valdes, Vince Della Croce, and Wes Wheeler.

This definition is being added as this technology is now required in Article 680. A definition will add clarity for the user of the Code to properly select and apply these solutions to meet the new requirements.

The phrase "personnel protection" was not included in this definition. Though the thresholds for the current that these devices respond to may be below fibrillation thresholds, they are not below human let-go thresholds which are characteristically associated with personnel protection from shock hazards.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 292-NFPA 70-2021 [Section No. 680.5]	

Related Item

- FR 8418

Submitter Information Verification

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Submittal Date: Fri Jul 30 09:40:48 EDT 2021
Committee: NEC-P17

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I, Thomas Domitrovich, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Comment (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Comment in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Comment and that I have full power and authority to enter into this copyright assignment.

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Public Comment No. 821-NFPA 70-2021 [Global Input]

The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

The Correlating Committee directs that FR 9274 be referred to CMP 3 for information regarding the definition for "Temporary Equipment".

Appliance, Fixed (CMP-7) 7690.

Appliance (CMP-17).

Appliance, Portable (CMP-7) 7690.

Equipment. (CMP-1).

Equipment, Portable (CMP-12)

Portable (CMP-12-17). 9396

Portable Equipment. (CMP-14-15-17). 8213

Mobile Equipment (CMP-14) 8748

Portable Power Distribution Unit. (CMP-15) 8640

Portable Structures (CMP-15)

Utilization Equipment (CMP-1)

Fastened-In-Place (CMP-12) 9473.

Fixed-In-Place (CMP-12) 9393.

Temporary Equipment (CMP-12) 9274

Additional Proposed Changes

File Name	Description	Approved
7_CN_393_Global.pdf	7 CN393	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 393 appeared in the First Draft Report on First Revision Nos. 7690, 9396, 8213, 8748, 8640, 9473 and 9393.

The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

The Correlating Committee directs that FR 9274 be referred to CMP 3 for information regarding the definition for "Temporary Equipment".

Appliance, Fixed (CMP-7) 7690.

Appliance (CMP-17).

Appliance, Portable (CMP-7) 7690.

Equipment. (CMP-1).

Equipment, Portable (CMP-12)

Portable (CMP-12-17). 9396

Portable Equipment. (CMP-14-15-17). 8213

Mobile Equipment (CMP-14) 8748

Portable Power Distribution Unit. (CMP-15) 8640

Portable Structures (CMP-15)

Utilization Equipment (CMP-1)

Fastened-In-Place (CMP-12) 9473.

Fixed-In-Place (CMP-12) 9393.

Temporary Equipment (CMP-12) 9274

Related Item

• First Revision No. 7690	• First Revision No. 9396	• First Revision No. 8213	• First Revision No. 8748	• First Revision No. 8640	• First Revision No. 9473	• First Revision No. 9393

Submitter Information Verification

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Committee: NEC-P17

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Public Comment No. 894-NFPA 70-2021 [Global Input]

The Correlating Committee establishes a task group to review the term Ground-Fault Circuit Interrupter and other terminology associated with ground-fault protective equipment throughout the NEC to ensure consistency with how these are defined in Article 100. The Task Group will consist of members of CMP 2, 7, 10 and 17.

Additional Proposed Changes

File Name	Description	Approved
CN_160_Global.pdf	70_CN160	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 160 appeared in the First Draft Report.

The Correlating Committee establishes a task group to review the term Ground-Fault Circuit Interrupter and other terminology associated with ground-fault protective equipment throughout the NEC to ensure consistency with how these are defined in Article 100. The Task Group will consist of members of CMP 2, 7, 10 and 17.

Related Item

• Correlating Note No. 160

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 15:43:56 EDT 2021
Committee: NEC-P02

Public Comment No. 896-NFPA 70-2021 [Global Input]

The Correlating Committee directs all panels to change the Section titles pertaining to reconditioning to "Reconditioned Equipment." and relocate the requirements to Section XXX.2 of the article if available or other section near the beginning of the article. If an article has multiple sections the panel should consider combining all reconditioning sections into subdivisions of XXX.2.

Additional Proposed Changes

File Name	Description	Approved
CN_259_Global.pdf	70_CN259	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 259 appeared in the First Draft Report.

The Correlating Committee directs all panels to change the Section titles pertaining to reconditioning to "Reconditioned Equipment." and relocate the requirements to Section XXX.2 of the article if available or other section near the beginning of the article. If an article has multiple sections the panel should consider combining all reconditioning sections into subdivisions of XXX.2.

Related Item

• Correlating Note No. 259

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 15:45:37 EDT 2021
Committee: NEC-P01

Public Comment No. 897-NFPA 70-2021 [Global Input]

The Correlating Committee requests that Panels 3, 7, 8, 9, 12, 13, 15, 16 and 18 reconsider the text "shall not be permitted to be" for clarification and ease of use. Simplifying the text to state "shall not be" is suggested as an alternative.

Additional Proposed Changes

File Name	Description	Approved
CN_260_Global.pdf	70_CN260	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 26 appeared in the First Draft Report.

The Correlating Committee requests that Panels 3, 7, 8, 9, 12, 13, 15, 16 and 18 reconsider the text "shall not be permitted to be" for clarification and ease of use. Simplifying the text to state "shall not be" is suggested as an alternative.

Related Item

• Correlating Note No. 260

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 04 15:47:24 EDT 2021
Committee: NEC-P03

Public Comment No. 1663-NFPA 70-2021 [Definition: Power-Supply Cord.]

Power-Supply Cord.

~~A length of flexible cord with an attachment plug at one end and individual cord conductors not terminated in a cord connector at the opposite end.~~

An assembly consisting of a cord connector and a length of flexible cord including ungrounded, grounded, and equipment grounding conductors that connects equipment to a receptacle, box, panel, or inlet for the purpose of establishing an electrical connection for power delivery; including hybrid communication, signal, and control circuits. (CMP-6)

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups appointed by the Correlating Committee. This task group consisted of John Kovacik, (CMP 12) chair, Dave Watson, (CMP 6) and Dean Hunter (CMP 7). The task group was assigned the following charge. The Correlating Committee notes that more than one related term is being used for “Power-Supply Cord.” Section 2.2.2.4 of the NEC Style Manual addresses terms with multiple definitions and states that if two or more definitions exist for a term, a task group shall be formed to work on the development of a single acceptable definition. If this cannot be accomplished, another term shall be selected or the term shall be identified in the context of the specific application. Therefore, the Correlating Committee established a Task Group to consider one definition for correlation. Additionally, the Correlating Committee assigned the definition of "Power-Supply Cord" to CMP-6.

There are two definitions for “Power-Supply Cord” in the First Draft Report for the 2023 NEC. The first is from Article 625 of the 2020 NEC where the definition is “Power-Supply Cord (as applied to EVSE (Electric Vehicle Supply Equipment)).” The second is a new definition created by CMP-6 for Article 100. The task group reviewed these definitions and concluded that one definition could be sufficient. This was accomplished by modifying the new definition created by CMP-6 to refer to it as an assembly consisting of a cord connector and a length of cord, including grounded, and ungrounded conductors connecting equipment through different types of terminations for power delivery, where the cord could include hybrid communication, signal and control circuits. This modified definition could cover all uses of the term “Power-Supply Cord.” Therefore, the definition for “Power-Supply Cord (as applied to EVSE)” is proposed to be deleted.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1662-NFPA 70-2021 [Definition: Power-Supply Cord (as applied to EVSE).]	Definition for a related term

Related Item

• FR 9274 (Global Input)

Submitter Information Verification

Submitter Full Name: John Kovacik
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 01:11:49 EDT 2021
Committee: NEC-P06

Public Comment No. 1961-NFPA 70-2021 [Global Input]

The Correlating Committee directs all panels to review all references to Article 722 under their purview. Class 1 system in Article 725 has been relocated to Article 722. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit public comments where necessary.

Additional Proposed Changes

File Name	Description	Approved
CN_375_Global.pdf	70_CN375	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 375 appeared in the First Draft Report.

The Correlating Committee directs all panels to review all references to Article 722 under their purview. Class 1 system in Article 725 has been relocated to Article 722. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit public comments where necessary.

Related Item

• Correlating Note No. 375

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:37:05 EDT 2021
Committee: NEC-P16

Public Comment No. 1964-NFPA 70-2021 [Global Input]

The Correlating Committee accepts the action taken by CMP 6 to create new Article 315 (FR 8616).

The Correlating Committee advises that article scope statements are the responsibility of the Correlating Committee and the Correlating Committee accepts the panel action.

The Correlating Committee directs all panels to review all references to Article 311 under their purview. Article 311 has been relocated to Article 315. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit Public Comments where necessary.

Additional Proposed Changes

File Name	Description	Approved
CN_390_Global.pdf	70_CN390	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 390 appeared in the First Draft Report.

The Correlating Committee accepts the action taken by CMP 6 to create new Article 315 (FR 8616).

The Correlating Committee advises that article scope statements are the responsibility of the Correlating Committee and the Correlating Committee accepts the panel action.

The Correlating Committee directs all panels to review all references to Article 311 under their purview. Article 311 has been relocated to Article 315. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit Public Comments where necessary.

Related Item

• Correlating Note No. 390

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:44:11 EDT 2021
Committee: NEC-P06

Public Comment No. 1967-NFPA 70-2021 [Definition: Dead Front.]

Dead Front.

Without live parts exposed to a person on the operating side of the equipment. (CMP-9)

Additional Proposed Changes

File Name	Description	Approved
CN_395.pdf	70_CN395	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 395 appeared in the First Draft Report.

The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the NEC Style Manual review this issue and the Correlating Committee establishes a Task Group with representation from CMPs 7 and 9 to review the term "Dead Front" to consider one definition for correlation, if applicable. The Correlating Committee assigns the definition "Dead Front" to CMP-9. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Related Item

• Correlating Note No. 395

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:51:03 EDT 2021
Committee: NEC-P09