Second Revision No. 8154-NFPA 70-2021 [Global Comment]

1) Revise the title of Article 210:

Article 210 Branch Circuits NotOver1000 Volts ac, 1500 Volts dc, Nominal

2) Revise the scope of Article 210:

210.1 Scope.

This article provides the general requirements for branch circuits not over 1000 volts ac, 1500 volts dc, nominal.

Informational Note: ~~For~~See Article 235 for requirements ~~that supplement or modify this article~~ for branch circuits over 1000 ~~V~~volts ac, 1500 ~~V~~volts dc ~~installations, see Article 235~~, nominal.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Thu Oct 21 17:43:34 EDT 2021

Committee Statement

Committee Statement: A new Article 235 is included in the 2023 NEC as a result of Second Revision 8155. This was the result of a Task Group formed based on Public Comment 635. The Scope of Article 210 is revised to reflect alignment with the voltage limits in Article 210 and the new Article 235. The title to the Article is updated to reflect this new limitation. The new article does not rely on Article 210; therefore, the statement that the article supplements or modifies Article 210 is no longer needed in the Informational Note. Additionally, the informational note is rewritten to comply with 4.1.3 of the NEC Style Manual. This is expected to be an Informational Note for one cycle, to assist users of the Code to easily identify the location of the related new Article.

Response Message: SR-8154-NFPA 70-2021

Public Comment No. 282-NFPA 70-2021 [Section No. 210.1]

Public Comment No. 635-NFPA 70-2021 [Section No. 210.1]

Public Comment No. 1292-NFPA 70-2021 [Section No. 210.1]

Second Revision No. 8155-NFPA 70-2021 [Global Comment]

Add a new Article 235, as follows:

Article 235 Branch Circuits Over 1000 Volts ac, 1500 Volts dc, Nominal

235.1 Scope.

This article includes general requirements for installations for branch circuits over 1000 volts ac or 1500 volts dc, nominal.

235.3 Other Articles for Specific-Purpose Branch Circuits.

Table 235.3 lists references for specific equipment and applications not located in Chapters 5, 6, and 7 that amend or supplement the requirements of this article.

Table 235.3 References for Specific Equipment and Applications Not Located in Chapters 5, 6, and 7

Equipment	Article	Section
Air-conditioning and refrigerating equipment		440.6, 440.31, and 440.32
Busways		368.17
Central heating equipment other than fixed electric space-heating equipment		422.12
Fixed electric heating equipment for pipelines and vessels		427.4
Fixed electric space-heating equipment		424.4
Fixed outdoor electrical deicing and snow-melting equipment		426.4
Infrared lamp industrial heating equipment		422.48 and 424.3
Motors, motor circuits, and controllers	430	

235.5 Conductor Identification for Branch Circuits.

(A) Grounded Conductor.

The grounded conductor of a branch circuit shall be identified in accordance with 200.6.

(B) Equipment Grounding Conductor.

The equipment grounding conductor shall be identified in accordance with 250.119.

(C) Ungrounded Conductors.

Ungrounded conductors shall be identified in accordance with 235.5(C)(1) or

(C)(2), as applicable.

(1) Branch Circuits Supplied from More Than One Nominal Voltage System.

Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and by nominal system voltage at all termination, connection, and splice points in accordance with 235.5(C)(1)(a) and (C)(1)(b). Different systems within the same premises that have the same nominal voltage shall be permitted to use the same identification.

(a) *Means of Identification.* The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means.

(b) *Posting of Identification Means.* The method used for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment. The label shall be of sufficient durability to withstand the environment involved and shall not be handwritten.

Exception: In existing installations where a voltage system(s) already exists and a different voltage system is being added, it shall be permissible to mark only the new system voltage. Existing unidentified systems shall not be required to be identified at each termination, connection, and splice point in accordance with 235.5(C)(1)(a) and (C)(1)(b). Labeling shall be required at each voltage system distribution equipment to identify that only one voltage system has been marked for a new system(s). The new system label(s) shall include the words "other unidentified systems exist on the premises."

(2) Branch Circuits Supplied from Direct-Current Systems.

Where a branch circuit is supplied from a dc system operating at more than 1500 volts, each ungrounded conductor of 4 AWG or larger shall be identified by polarity at all termination, connection, and splice points by marking tape, tagging, or other approved means and each ungrounded conductor of 6 AWG or smaller shall be identified by polarity at all termination, connection, and splice points in compliance with 235.5(C)(2)(a) and (C)(2)(b). The identification methods used for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment.

(a) *Positive Polarity, Sizes 6 AWG or Smaller.* Where the positive polarity of a dc system does not serve as the connection point for the grounded conductor, each positive ungrounded conductor shall be identified by one of the following means:

(1) A continuous red outer finish

(2) A continuous red stripe durably marked along the conductor's entire length on insulation of a color other than green, white, gray, or black

(3) Imprinted plus signs (+) or the word POSITIVE or POS durably

marked on insulation of a color other than green, white, gray, or black and repeated at intervals not exceeding 610 mm (24 in.) in accordance with 310.8(B)

(4) An approved permanent marking means such as sleeving or shrink-tubing that is suitable for the conductor size, at all termination, connection, and splice points, with imprinted plus signs (+) or the word POSITIVE or POS durably marked on insulation of a color other than green, white, gray, or black

(b) *Negative Polarity, Sizes 6 AWG or Smaller.* Where the negative polarity of a dc system does not serve as the connection point for the grounded conductor, each negative ungrounded conductor shall be identified by one of the following means:

(1) A continuous black outer finish

(2) A continuous black stripe durably marked along the conductor's entire length on insulation of a color other than green, white, gray, or red

(3) Imprinted minus signs (–) or the word NEGATIVE or NEG durably marked on insulation of a color other than green, white, gray, or red and repeated at intervals not exceeding 610 mm (24 in.) in accordance with 310.8(B)

(4) An approved permanent marking means such as sleeving or shrink-tubing that is suitable for the conductor size, at all termination, connection, and splice points, with imprinted minus signs (–) or the word NEGATIVE or NEG durably marked on insulation of a color other than green, white, gray, or red

235.6 Branch-Circuit Voltage Limitations Over 1000 volts ac or 1500 volts dc, Nominal, Between Conductors.

Circuits exceeding 1000 volts ac or 1500 volts dc, nominal, between conductors shall be permitted to supply utilization equipment in installations where conditions of maintenance and supervision ensure that only qualified persons service the installation.

235.9 Circuits Derived from Autotransformers.

Branch circuits shall not be derived from autotransformers unless the circuit supplied has a grounded conductor that is electrically connected to a grounded conductor of the system supplying the autotransformer.

235.10 Ungrounded Conductors Tapped from Grounded Systems.

Two-wire dc circuits and ac circuits of two or more ungrounded conductors shall be permitted to be tapped from the ungrounded conductors of circuits that have a grounded neutral conductor. Switching devices in each tapped circuit shall have a pole in each ungrounded conductor. All poles of multipole switching devices shall manually switch together where such switching devices also serve as a disconnecting means as required by the following sections:

(1) 410.93 for double-pole switched lampholders

(2) 410.104(B) for electric-discharge lamp auxiliary equipment switching devices

(3) 422.31(B) for an appliance

(4) 424.20 for a fixed electric space-heating unit

(5) 426.51 for electric deicing and snow-melting equipment

(6) 430.85 for a motor controller

(7) 430.103 for a motor

235.11 Branch Circuits Required.

The minimum number of branch circuits shall be determined from the total calculated load and the size or rating of the circuits used. In all installations, the number of circuits shall be sufficient to supply the load served.

235.18 Rating.

Branch circuits recognized by this article shall be rated in accordance with the maximum permitted ampere rating or setting of the overcurrent device. Where conductors of higher ampacity are used for any reason, the ampere rating or setting of the specified overcurrent device shall determine the circuit rating.

235.19 Conductors — Minimum Ampacity and Size.

The ampacity of conductors shall be in accordance with 310.14 and 315.60, as applicable. Branch-circuit conductors shall be sized in accordance with 235.19(A) or (B).

(A) General.

The ampacity of branch-circuit conductors shall not be less than 125 percent of the designed potential load of utilization equipment that will be operated simultaneously.

(B) Supervised Installations.

For supervised installations, branch-circuit conductor sizing shall be permitted to be determined by qualified persons under engineering supervision. Supervised installations are defined as those portions of a facility where both of the following conditions are met:

(1) Conditions of design and installation are provided under engineering supervision.

(2) Qualified persons with documented training and experience in over 1000-volt ac or 1500-volt dc systems provide maintenance, monitoring, and servicing of the system.

235.20 Overcurrent Protection.

Branch-circuit conductors and equipment shall be protected by overcurrent protective devices that have a rating or setting that complies with 235.20(A) through (C).

(A) Continuous and Noncontinuous Loads.

Where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than

the noncontinuous load plus 125 percent of the continuous load.

Exception: Where the assembly, including the overcurrent devices protecting the branch circuit(s), is listed for operation at 100 percent of its rating, the ampere rating of the overcurrent device shall be permitted to be not less than the sum of the continuous load plus the noncontinuous load.

(B) Conductor Protection.

Conductors shall be protected in accordance with the ampacities specified in 310.14 or 315.60, as applicable.

(C) Equipment.

The rating or setting of the overcurrent protective device shall not exceed that specified in the applicable articles referenced in Table 240.3 for equipment.

235.22 Permissible Loads, Individual Branch Circuits.

An individual branch circuit shall be permitted to supply any load for which it is rated, but in no case shall the load exceed the branch-circuit ampere rating.

235.23 Permissible Loads, Multiple-Outlet Branch Circuits.

A branch circuit supplying two or more outlets or receptacles shall supply only the loads specified according to its size in accordance with 210.23(A) through (E) and as summarized in 210.24, and in no case shall the load exceed the branch-circuit ampere rating.

(A) 15- and 20-Ampere Branch Circuits.

A 15- or 20-ampere branch circuit shall be permitted to supply lighting outlets, lighting units, or other utilization equipment, or any combination of them, and shall comply with 235.23(A)(1) and (A)(2).

(1) Cord-and-Plug-Connected Equipment Not Fastened in Place.

The rating of any one cord-and-plug-connected utilization equipment not fastened in place shall not exceed 80 percent of the branch-circuit ampere rating.

(2) Utilization Equipment Fastened in Place.

The total rating of utilization equipment fastened in place, other than luminaires, shall not exceed 50 percent of the branch-circuit ampere rating where lighting units, cord-and-plug-connected utilization equipment not fastened in place, or both, are also supplied.

(B) 30-Ampere Branch Circuits.

A 30-ampere branch circuit shall be permitted to supply fixed lighting units with heavy-duty lampholders in other than a dwelling unit(s) or utilization equipment in any occupancy. The rating of any one cord-and-plug-connected utilization equipment shall not exceed 80 percent of the branch-circuit ampere rating.

(C) 40- and 50-Ampere Branch Circuits.

A 40- or 50-ampere branch circuit shall be permitted to supply cooking appliances that are fastened in place in any occupancy. In other than dwelling units, such circuits shall be permitted to supply fixed lighting units with heavy-duty lampholders, infrared heating units, or other utilization equipment.

(D) Branch Circuits Larger Than 50 Amperes.

Branch circuits larger than 50 amperes shall supply only nonlighting outlet loads.

235.63 Equipment Requiring Servicing.

A 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet shall be installed at an accessible location within 7.5 m (25 ft) of the equipment as specified in 210.63(A) and (B).

Informational Note: See 210.8(E) for requirements on GFCI protection.

(A) Heating, Air-Conditioning, and Refrigeration Equipment.

The required receptacle outlet shall be located on the same level as the heating, air-conditioning, and refrigeration equipment. The receptacle outlet shall not be connected to the load side of the equipment's branch-circuit disconnecting means.

Exception: A receptacle outlet shall not be required at one- and two-family dwellings for the service of evaporative coolers.

(B) Other Electrical Equipment.

In other than one- and two-family dwellings, a receptacle outlet shall be located as specified in 210.63(B)(1) and (B)(2).

(1) Indoor Service Equipment.

The required receptacle outlet shall be located within the same room or area as the service equipment.

(2) Indoor Equipment Requiring Dedicated Equipment Spaces.

Where equipment, other than service equipment, requires dedicated equipment space as specified in 110.26(E), the required receptacle outlet shall be located within the same room or area as the electrical equipment and shall not be connected to the load side of the equipment's disconnecting means.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8155_Article_235.docx	staff use	

Submitter Information Verification

Committee: NEC-P02
Submittal Date: Thu Oct 21 17:57:46 EDT 2021

Committee Statement

Committee Statement: Article 235 was proposed (PC 285) by a Task Group formed based on Public Comment 635. This proposal forms the basis for this CMP 2 action to create Article 235, which includes requirements for branch circuits rated over 1000 Vac, 1500 Vdc, nominal (referred to here as "medium voltage branch circuits"). Sections from Article 210 that are applicable to medium voltage branch circuits have been copied and moved to this new Article. References to Section 311.60 in Article 210 are revised to indicate Section 315.60 in this new Article.

The following sections are included in this Article that have been removed from Article 210:

• 210.6(E) is now included in 235.6

• 210.19(B) and 210.19(E) are now included in 235.19

The following Sections are a duplicate to those that are in Article 210 but are included here to ensure completeness of this new Article 235. The requirements of each of these sections were reviewed for applicability to medium voltage branch circuits and modified accordingly without making technical changes modifying the existing requirements for medium voltage branch circuits:

• 210.9 has been included as part of 235.9

• 210.10 has been included as part of 235.10

• 210.11 has been included as part of 235.11

• 210.18 has been included as part of 235.18

• 210.20 has been included as part of 235.20

• 210.22 has been included as part of 235.22

• 210.23 has been included as part of 235.23

• 210.63 has been included as part of 235.63

Response Message: SR-8155-NFPA 70-2021

Public Comment No. 285-NFPA 70-2021 [New Article after 230]

Second Revision No. 7944-NFPA 70-2021 [Detail]

Add a new Exception No. 4 to Section 210.8(A) Dwelling Unit:

Exception No. 4: Factory-installed receptacles that are not readily accessible and are mounted internally to bathroom exhaust fan assemblies shall not require GFCI protection unless required by the installation instructions or listing.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR7944_210.8_A_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 12:50:33 EDT 2021

Committee Statement

Committee Statement: Exception No. 4 is a new exception for an internal exhaust fan receptacle. This receptacle is located internal to the exhaust fan and is not accessible as a convenience receptacle meant for use in plugging-in equipment.

***

This revision is a separately balloted change that modifies SR-7950.

Response Message: SR-7944-NFPA 70-2021

Public Comment No. 1126-NFPA 70-2021 [New Section after 210.8(A)]

Second Revision No. 7956-NFPA 70-2021 [Detail]

Revise existing (6) and add new (7) in 210.8 (A) Dwelling Units:

(6) Kitchens ~~— where the receptacles are installed to serve the countertop surfaces~~

(7) Areas with sinks and permanent provisions for food preparation, beverage preparation, or cooking

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR7956_210.8_A_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 13:29:39 EDT 2021

Committee Statement

Committee Statement: GFCI protection was expanded to address any cord and plug appliance in the kitchen, regardless of whether the receptacle serves the countertop. The CPSC database demonstrates 104 electrocutions from 2011-2020, of which 81 percent were working on an appliance or other type of appliance or equipment. GFCI protection can be provided to provide protection for those who are working on cord-and-plug appliances and/or cord-and-plug-connected equipment. Electrical hazards are not just due to the proximity of the appliance to water. These appliances and equipment have both the power supply and the grounded frame to complete the current path, creating the hazard to the individual.

***

This revision is a separately balloted change that modifies SR-7950.

Response Message: SR-7956-NFPA 70-2021

Public Comment No. 1536-NFPA 70-2021 [Section No. 210.8(A)]

Second Revision No. 7961-NFPA 70-2021 [Detail]

Revise 210.8(B)(7):

(7) Sinks where receptacles or cord-and-plug-connected fixed ~~and~~ or stationary appliances are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR7961_210.8_B_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 14:34:16 EDT 2021

Committee Statement

Committee Statement: Instead of fixed “and” stationary, the text was modified to recognize fixed “or” stationary for clarity. Equipment can’t be “fixed” and “stationary” at the same time.

***

This revision is a separately balloted change that modifies SR-7958.

Response Message: SR-7961-NFPA 70-2021

Public Comment No. 1757-NFPA 70-2021 [Section No. 210.8(B)]

Second Revision No. 8019-NFPA 70-2021 [Detail]

In 210.12(B), add the following list item after 'Laundry areas':

(14) Garages. This requirement shall become effective January 1, 2025.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8019_210.12_B_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 14:32:49 EDT 2021

Committee Statement

Committee Statement: The number of garage fires warrant the addition of AFCI protection to these areas. AFCIs protect the branch circuits along with the cords to the various pieces of equipment in a garage, many of which operate unattended for long periods of time. The effective date has been added to allow manufacturers of utilization equipment time to ensure their products are compatible with AFCI protection. The date was modified from the one proposed in the comment to correlate with other effective dates in this section.

***

This revision is a separately balloted change that modifies SR-8203.

Response Message: SR-8019-NFPA 70-2021 CMP-2

Public Comment No. 1768-NFPA 70-2021 [Section No. 210.12(B)]

Second Revision No. 8204-NFPA 70-2021 [Detail]

In 210.12(B), add the following list item after 'Laundry areas':

(15) Bathrooms. This requirement shall become effective January 1, 2025.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8204_210.12_B_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Fri Oct 22 19:36:42 EDT 2021

Committee Statement

Committee Statement: Adding AFCI protection afforded by 210.12(B) to bathrooms of a dwelling would help to safeguard the public from the danger of electrical fires. The effective date has been added to allow manufacturers of utilization equipment time to ensure their products are compatible with AFCI protection.

***

This revision is a separately balloted change that modifies SR-8203.

Response Message: SR-8204-NFPA 70-2021

Public Comment No. 1765-NFPA 70-2021 [Section No. 210.12(B)]

Second Revision No. 8205-NFPA 70-2021 [Detail]

Revise 210.12(C) as follows to include 10-ampere branch circuits:

(C) Dormitory Units.

All 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying outlets or devices installed in the following locations shall be protected by any of the means described in 210.12(A)(1) through (A)(6):

(1) Bedrooms
(2) Living rooms
(3) Hallways
(4) Closets
(5) Bathrooms
(6) Similar rooms

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8205_210.12_C_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02
Submittal Date: Fri Oct 22 19:51:01 EDT 2021

Committee Statement

Committee Statement: 10-ampere branch circuits have been added to this subsection to align with the other subsections in 210.12.

***

This revision is a separately balloted change that modifies SR-8203.

Response Message: SR-8205-NFPA 70-2021

Public Comment No. 1758-NFPA 70-2021 [Section No. 210.12(C)]

Second Revision No. 8206-NFPA 70-2021 [Detail]

Revise 210.12(D) as follows to include 10-ampere branch circuits:

(D) Other Occupancies.

All 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying outlets or devices installed in guest rooms and guest suites of hotels and motels, and in areas used exclusively as patient sleeping rooms in nursing homes and limited-care facilities shall be protected by any of the means described in 210.12(A)(1) through (A)(6):

(1) Guest rooms and guest suites of hotels and motels

(2) Areas used exclusively as patient sleeping rooms in nursing homes and limited-care facilities

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8206_210.12_D_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Fri Oct 22 19:51:39 EDT 2021

Committee Statement

Committee Statement: 10-ampere branch circuits have been added to this subsection to align with the other subsections in 210.12.

***

This revision is a separately balloted change that modifies SR-8203.

Response Message: SR-8206-NFPA 70-2021

Public Comment No. 1759-NFPA 70-2021 [Section No. 210.12(D)]

Second Revision No. 8208-NFPA 70-2021 [Detail]

Revise Informational Note No. 2 in 210.52(C)(4) as follows:

Informational Note No. 2: See Informative Annex J and ANSI/ICC A117.1-2009, *Standard on Accessible and Usable Buildings and Facilities*.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 11:40:22 EDT 2021

Committee Statement

Committee Statement: The word 'Informative' is added before 'Annex' to clarify that the annex is informative.

***

This revision is a separately balloted change that modifies SR-8090.

Section 210.52(C)(4) will be renumbered as 210.52(C)(3) by SR-8210.

Response Message: SR-8208-NFPA 70-2021

Public Comment No. 661-NFPA 70-2021 [Section No. 210.52(C)]

Second Revision No. 8209-NFPA 70-2021 [Detail]

Revise 210.52(C)(3) to add the following sentence:

If a receptacle outlet is not provided to serve an island or peninsular countertop or work surface, provisions shall be provided at the island or peninsula for future addition of a receptacle outlet to serve the island or peninsular countertop or work surface.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 11:52:45 EDT 2021

Committee Statement

Committee Statement: If a receptacle outlet is not provided to serve an island or peninsular countertop or work surface, provisions shall be provided at the island or peninsula for future addition of a receptacle outlet to serve the island or peninsular countertop or work surface.

***

This revision is a separately balloted change that modifies SR-8090.

Section 210.52(C)(3) will be renumbered as 210.52(C)(2) by SR-8210.

Response Message: SR-8209-NFPA 70-2021

Second Revision No. 8210-NFPA 70-2021 [Detail]

Revise 210.52(C) in accordance with the following:

(C) Countertops and Work Surfaces.

In kitchens, pantries, breakfast rooms, dining rooms, and similar areas of dwelling units, receptacle outlets for countertop and work surfaces that are 300 mm (12 in.) or wider shall be installed in accordance with 210.52(C)(1) through (C)~~(4)~~(3)and shall not be considered as the receptacle outlets required by 210.52(A).

For the purposes of this section, where using multioutlet assemblies, each 300 mm (12 in.) of multioutlet assembly containing two or more receptacles installed in individual or continuous lengths shall be considered to be one receptacle outlet.

~~**(1)**~~

~~For the purposes of this section, receptacles installed in accordance with either of the following shall be considered as one receptacle outlet:~~

~~(1) Each 300 mm (12 in.) of multioutlet assembly containing two or more receptacles installed in individual or continuous lengths~~

~~(2) Each two receptacles installed in the same device box~~

(1) Wall Spaces.

Receptacle outlets shall be installed so that no point along the wall line is more than 600 mm (24 in.) measured horizontally from a receptacle outlet in that space.

Exception: Receptacle outlets shall not be required directly behind a range, counter-mounted cooking unit, or sink in the installation described in Figure 210.52(C)(1).

Figure 210.52(C)(1) Determination of Area Behind a Range, Counter-Mounted Cooking Unit, or Sink.

[NO CHANGES TO FIGURE]

(2) Island and Peninsular Countertops and Work Surfaces.

Receptacle outlets shall be installed in accordance with 210.52(C)(3)(a) and (C)(3)(b).

(a) Locations with Countertop or Work Surface Wall Spaces.At least one receptacle outlet shall be installed where the location is also provided with countertops or work surfaces totaling more than 1.2 linear m (4 linear ft).

(b) Locations without Countertop or Work Surface Wall Spaces. Receptacle outlets shall be installed in accordance with one of the following. Receptacle outlets shall be permitted to be located as determined by the installer, designer, or building owner.

Where a peninsular countertop is connected to a wall countertop, the peninsular countertop shall be measured from the connected wall countertop. Where a peninsular countertop is connected to a wall, the peninsular countertop shall be measured from the wall.

(3) Receptacle Outlet Location.

Receptacle outlets shall be located in one or more of the following:

(1) On or above countertop or work surfaces:On or above, but not more than 500 mm (20 in.) above, countertops or work surfaces.

(2) In countertop or work surfaces: Receptacle outlet assemblies listed for use in countertops or work surfaces shall be permitted to be installed in countertops or work surfaces.

(3) Below countertop or works surfaces: Not more than 300 mm (12 in.) below countertops or work surfaces. Receptacles installed below a countertop or work surface shall not be located where the countertop or work surface extends more than 150 mm (6 in.) beyond the face of such receptacles.

Receptacle outlets rendered not readily accessible by appliances fastened in place, appliance garages, sinks, or rangetops as covered in 210.52(C)(1), Exception, or appliances occupying assigned spaces shall not be considered as these required outlets.

Informational Note No. 1: See 406.5(E) and ~~406.5(G)~~for installation of receptacles in countertops and 406.5(F) and ~~406.5(G)~~for installation of receptacles in work surfaces. See 380.10 for installation of multioutlet assemblies.

Informational Note No. 2: See AnnexJ andANSI/ICC A117.1-2009, *Standard on Accessible and Usable Buildings and Facilities*.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8210_210.52_C_Detail.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 11:59:44 EDT 2021

Committee Statement

Committee Statement: After considering the revision made in the first revision, the committee has reviewed the language and decided the 2020 NEC language appropriately communicates the correct requirement. The items in 210.52(C) are renumbered due to the removal of item (1).

***

This revision is a separately balloted change that modifies SR-8090.

Response Message: SR-8210-NFPA 70-2021

Public Comment No. 1305-NFPA 70-2021 [Section No. 210.52(C)(1)]

Public Comment No. 1525-NFPA 70-2021 [Section No. 210.52(C)(1)]

Public Comment No. 2040-NFPA 70-2021 [Section No. 210.52(C)(1)]

Second Revision No. 7893-NFPA 70-2021 [Definition: Branch Circuit, Appliance.]

Branch Circuit, Appliance. (Appliance Branch Circuit)

A branch circuit that supplies energy to one or more outlets to which appliances are to be connected and that has no permanently connected luminaires that are not a part of an appliance. (CMP-2)

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 10:56:09 EDT 2021

Committee Statement

Committee Statement: This change brings the definition into compliance with section 2.2.2.3.1 of the Style Manual, Defined Term, which requires the following: “To assist in electronic searching, the defined term shall then appear in parentheses as it would be found in the document.”

Response Message: SR-7893-NFPA 70-2021

Public Comment No. 1220-NFPA 70-2021 [Definition: Branch Circuit, Appliance.]

Second Revision No. 7896-NFPA 70-2021 [Definition: Branch Circuit, General-Purpose.]

Branch Circuit, General-Purpose. (General-Purpose Branch Circuit)

A branch circuit that supplies two or more receptacles or outlets for lighting and appliances. (CMP-2)

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 10:59:20 EDT 2021

Committee Statement

Committee Statement: This change brings the definition into compliance with section 2.2.2.3.1 of the Style Manual, Defined Term, which requires the following: “To assist in electronic searching, the defined term shall then appear in parentheses as it would be found in the document.”

Response Message: SR-7896-NFPA 70-2021

Public Comment No. 1219-NFPA 70-2021 [Definition: Branch Circuit, General-Purpose.]

Second Revision No. 7900-NFPA 70-2021 [Definition: Branch Circuit, Individual.]

Branch Circuit, Individual. (Individual Branch Circuit)

A branch circuit that supplies only one utilization equipment. (CMP-2)

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 11:01:37 EDT 2021

Committee Statement

Committee Statement: This change brings the definition into compliance with section 2.2.2.3.1 of the Style Manual, Defined Term, which requires the following: “To assist in electronic searching, the defined term shall then appear in parentheses as it would be found in the document.”

Response Message: SR-7900-NFPA 70-2021

Public Comment No. 1218-NFPA 70-2021 [Definition: Branch Circuit, Individual.]

Second Revision No. 7902-NFPA 70-2021 [Definition: Cooking Unit, Counter-Mounted.]

Cooking Unit, Counter-Mounted. (Counter-Mounted Cooking Unit)

A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and built-in or mountable controls. (CMP-2)

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 11:05:11 EDT 2021

Committee Statement

Committee Statement: This change brings the definition into compliance with section 2.2.2.3.1 of the Style Manual, Defined Term, which requires the following: “To assist in electronic searching, the defined term shall then appear in parentheses as it would be found in the document.”

Response Message: SR-7902-NFPA 70-2021

Public Comment No. 1221-NFPA 70-2021 [Definition: Cooking Unit, Counter-Mounted.]

Second Revision No. 7906-NFPA 70-2021 [New Definition after Definition: Corrosive Environment — Sw...]

Counter (Countertop).

A fixed or stationary surface typically intended for food preparation and serving, personal lavation, or laundering or a similar surface that presents a routine risk of spillage of larger quantities of liquids upon outlets mounted directly on or in the surface. (CMP-2)

Informational Note No. 1: See UL 498, *Receptacles and Attachment Plugs* , and UL 943, *Ground-Fault Circuit Interrupters* , which establish the performance evaluation criteria and construction criteria.

Informational Note No. 2: See 406.5(E) , 406.5(G)(1) , and 406.5(H) for information on receptacles for counters and countertops distinguished from receptacles for work surfaces.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 11:16:06 EDT 2021

Committee Statement

Committee Statement: The definition for counter (countertop) is added to help the user of the Code understand the difference between a countertop and a work surface where these two terms are used. The main difference between these two types of surfaces is primarily associated with the amount of spillage they may be exposed to. This new definition and informational note directs the user of the Code to the standards that aid in the proper application of receptacles in these locations.

Response Message: SR-7906-NFPA 70-2021

Public Comment No. 2217-NFPA 70-2021 [New Definition after Definition: Corrosive Environment — Sw...]

Second Revision No. 7907-NFPA 70-2021 [New Definition after Definition: Wireways, Nonmetallic. (No...]

Work Surface.

A fixed, stationary, or portable surface typically intended for dry use and for tasks other than food preparation, personal lavation, or laundering that presents an incidental risk of spillage of smaller quantities of beverages and other liquids upon outlets mounted directly on or recessed in the surface. (CMP-2)

Informational Note No. 1: See UL 111, *Outline of Investigation for Multioutlet Assemblies* , and UL 962A, *Furniture Power Distribution Units* , which establish the performance evaluation criteria and construction criteria.

Informational Note No. 2: See 406.5(F) , 406.5(G)(1) , and 406.5(H) for information on receptacles for work surfaces distinguished from receptacles for counters and countertops.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 11:19:34 EDT 2021

Committee Statement

Committee Statement: The definition for work surface is added to help the user of the Code understand the difference between a countertop and a work surface where these two terms are used. The main difference between these two types of surfaces is primarily associated with the amount of spillage they may be exposed to. This new definition and informational note directs the user of the Code to the standards that aid in the proper application of receptacles in these locations.

Response Message: SR-7907-NFPA 70-2021

Public Comment No. 2219-NFPA 70-2021 [New Definition after Definition: Wireways, Nonmetallic. (No...]

Second Revision No. 7916-NFPA 70-2021 [Section No. 210.4(A)]

(A) General.

Branch circuits recognized by this article shall be permitted as multiwire circuits. A multiwire circuit shall be permitted to be considered as multiple circuits. ~~All~~ Except as permitted in 300.3(B)(4) , all conductors of a multiwire branch circuit shall originate from the equipment containing the branch-circuit overcurrent protective device or protective devices .

Informational Note No. 1: A 3-phase, 4-wire, wye-connected power system used to supply power to nonlinear loads might necessitate that the power system design allow for the possibility of high harmonic currents on the neutral conductor.

Informational Note No. 2: See 300.13(B) for continuity of grounded conductors on multiwire circuits.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 11:32:30 EDT 2021

Committee Statement

Committee Statement: A reference to 300.3(B)(4) is added to correlate with the permission for column-width panelboard enclosures that the neutral conductor is permitted to originate in the pull box. Section 210.4 requires that all conductors of a multiwire branch circuit originate from the equipment containing the branch circuit overcurrent protective device or devices. This change recognizes multiwire branch circuits are permitted in column-width panelboard enclosures where the neutral conductor originates in the pull box.

The phrase “or protective devices” was added to recognize that the equipment could contain more than one protective device.

Response Message: SR-7916-NFPA 70-2021

Public Comment No. 7-NFPA 70-2021 [Section No. 210.4(A)]

Second Revision No. 8157-NFPA 70-2021 [Section No. 210.6(D)]

(D) 1000 Volts ac or 1500 Volts dc Between Conductors.

Circuits exceeding 277 volts, nominal, to ground and not exceeding 1000 volts ac or 1500 volts dc , nominal, between conductors shall be permitted to supply the following:

(1) The auxiliary equipment of electric-discharge lamps mounted in permanently installed luminaires where the luminaires are mounted in accordance with one of the following:

a. Not less than a height of 6.7 m (22 ft) on poles or similar structures for the illumination of outdoor areas such as highways, roads, bridges, athletic fields, or parking lots

b. Not less than a height of 5.5 m (18 ft) on other structures such as tunnels

Informational Note: See 410.137 for auxiliary equipment limitations.

(2) Cord-and-plug-connected or permanently connected utilization equipment other than luminaires

(3) Luminaires powered from direct-current systems where either of the following apply:

a. The luminaire contains a listed, dc-rated ballast that provides isolation between the dc power source and the lamp circuit and protection from electric shock when changing lamps.

b. The luminaire contains a listed, dc-rated ballast and has no provision for changing lamps.

Exception No. 1 to (B), (C), and (D): For lampholders of infrared industrial heating appliances as provided in 425.14.

Exception No. 2 to (B), (C), and (D): For railway properties as described in 110.19.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8157_210.6_D_.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Thu Oct 21 18:11:40 EDT 2021

Committee Statement

Committee Statement: A new Article 235 is included in the 2023 NEC as a result of Second Revision 8155. This was the result of a Task Group formed based on Public Comment 635. This results in the need to revise the voltage limits in Section 210.6(D) to align with the change in the scope of Article 210.

Response Message: SR-8157-NFPA 70-2021

Public Comment No. 283-NFPA 70-2021 [Section No. 210.6(D)]

Second Revision No. 7918-NFPA 70-2021 [Section No. 210.7]

210.7 Multiple Branch Circuits.

~~Where~~ If two or more branch circuits supply devices or equipment on the same yoke or mounting strap, a means to simultaneously disconnect the ungrounded supply conductors shall be provided at the point at which the branch circuits originate.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 11:37:22 EDT 2021

Committee Statement

Committee Statement: The word “Where” is being changed to “If” to align with the style manual requirements of section 3.3.4. The word “if” is a condition and “where” is a location.

The reference to a multigang box was not accepted. This requirement impacts where two or more branch circuits supply devices or equipment on the same yoke or mounting strap. The suggested language is not necessary.

Response Message: SR-7918-NFPA 70-2021

Public Comment No. 749-NFPA 70-2021 [Section No. 210.7]

Second Revision No. 7950-NFPA 70-2021 [Section No. 210.8(A)]

Detail SR-7944

Detail SR-7956

(A) Dwelling Units.

All 125-volt through 250-volt receptacles installed in the following locations ~~specified in 210.8(A)(1) through (A)(11)~~ and supplied by single-phase branch circuits rated 150 volts or less to ground shall have ground-fault circuit-interrupter protection for personnel:

(1) Bathrooms

(2) Garages and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use

(3) Outdoors

(4) Crawl spaces — at or below grade level

(5) Basements

~~Informational Note: See 760.41(B) and 760.121(B) for power supply requirements for fire alarm systems.~~

~~Receptacles installed under the exception to 210.8(A)(5) shall not be considered as meeting the requirements of 210.52(G).~~

(6) Kitchens ~~— where the receptacles are installed to serve the countertop surfaces~~

(7) Areas with sinks and permanent provisions for food preparation, beverage preparation, or cooking

(8) Sinks — where receptacles are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink

(9) Boathouses

(10) Bathtubs or shower stalls — where receptacles are installed within 1.8 m (6 ft) of the outside edge of the bathtub or shower stall

(11) Laundry areas

(12) Indoor damp and wet locations

Exception No. 1: Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, deicing, or pipeline and vessel heating equipment shall be permitted to be installed in accordance with 426.28 or 427.22, as applicable.

Exception No. 2: A receptacle supplying only a permanently installed ~~fire alarm or burglar alarm~~premises security system shall ~~not be required to have~~be permitted to omit ground-fault circuit-interrupter protection.

Exception No. 3: Listed ~~locking support and mounting~~weight-supporting ceiling receptacles (WSCR) utilized in combination with compatible weight-supporting attachment fittings (WSAF) installed for the purpose of ~~serving~~supporting a ceiling luminaire or ceiling-suspended fan shall ~~not be required to be~~be permitted to omit ground-fault circuit-interrupter ~~protected~~protection. If a general-purpose convenience receptacle is integral to the ceiling luminaire or ceiling-suspended fan, GFCI protection shall be provided.

Exception No. 4: Factory-installed receptacles that are not readily accessible and are mounted internally to bathroom exhaust fan assemblies shall not require GFCI protection unless required by the installation instructions or listing.

Informational Note: See 760.41(B) and 760.121(B) for power supply requirements for fire alarm systems.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR7950_210.8_A_.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 13:16:52 EDT 2021

Committee Statement

Committee Statement: The reference to single phase was not removed. The language in this section only applies to 120 V through 240 V receptacles that are supplied by branch circuits 150 V or less to ground.

The renumbering of the exceptions is not accepted as the numbering scheme is required by the Style Manual, 2.6.2. In addition, the exceptions were not associated only with a specific section, as the language is clear and driven by the load served, rather than just in a specific location.

Exception 2 was modified, removing “fire alarm” because the structure of the Code under 90.3 already addresses this in fire alarm branch circuit requirements found 760.41 and 760.121. “Burglar alarm systems” was modified to align with the phrase “premises security systems” which is taken from NFPA 731 and NFPA 730. “Shall not be required to have” was modified to align with the Style Manual.

Exception 3 was modified for clarity. The word “Paddle” was not added to ensure that all ceiling fans are addressed. Exception 3 was also modified to make the language permissive per the Style Manual.

The informational note was relocated to the end of 210.8(A) for clarity and usability.

***

Revisions to item (6) and the addition of new item (7) are balloted separately on SR-7956.

New Exception No. 4 is balloted separately on SR-7944.

Response Message: SR-7950-NFPA 70-2021

Public Comment No. 159-NFPA 70-2021 [Section No. 210.8(A)]

Public Comment No. 850-NFPA 70-2021 [Section No. 210.8(A)]

Second Revision No. 7958-NFPA 70-2021 [Section No. 210.8(B)]

Detail SR-7961

(B) Other Than Dwelling Units.

All 125-volt through 250-volt receptacles supplied by single-phase branch circuits rated 150 volts or less to ground, 50 amperes or less, and all receptacles supplied by three-phase branch circuits rated 150 volts or less to ground, 100 amperes or less, installed in the following locations shall be provided with GFCI protection:

(1) Bathrooms

(2) Kitchens

(3) Areas with sinks and permanent provisions for food preparation, beverage preparation, or cooking

(4) Buffet serving areas with permanent provisions for food serving, beverage serving, or cooking

(5) Rooftops

~~Exception to (5): Receptacles on rooftops shall not be required to be readily accessible other than from the rooftop.~~

(6) Outdoors

(7) Sinks where receptacles or cord-and-plug-connected fixed ~~and~~or stationary appliances are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink

~~Exception No. 1 to (7): In industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program in accordance with 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power is interrupted or that has a design not compatible with GFCI protection.~~

~~Exception No. 2 to (7): In industrial laboratories, receptacles used to supply equipment where removal of power would introduce a greater hazard shall be permitted to be installed without GFCI protection.~~

~~Exception No. 3 to (7): Receptacles located in patient bed locations of Category 2 (general care) or Category 1 (critical care) spaces of health care facilities shall be permitted to comply with 517.21~~.

(8) Indoor damp or wet locations

(9) Locker rooms with associated showering facilities

(10) Garages, accessory buildings, service bays, and similar areas other than vehicle exhibition halls and showrooms

(11) Crawl spaces at or below grade level

(12) Unfinished areas of basements

~~Exception to (1) through (7), (10), and (12): Listed locking support and mounting receptacles used in combination with compatible attachment fittings installed for the purpose of serving a ceiling luminaire or ceiling fan shall not be required to be GFCI protected. If a general-purpose convenience receptacle is integral to the ceiling luminaire or ceiling fan, GFCI protection shall be provided.~~

(13) Aquariums, bait wells, and similar open aquatic vessels or containers, such as tanks or bowls, where receptacles are installed within 1.8 m (6 ft.) from the top inside edge or rim or from the conductive support framing of the vessel or container

(14) Laundry areas

(15) Bathtubs and shower stalls where receptacles are installed within 1.8 m (6 ft) of the outside edge of the bathtub or shower stall

Exception No. 1: Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, deicing, or pipeline and vessel heating equipment shall be permitted to be installed in accordance with 426.28 or 427.22, as applicable.

Exception No. 2: Receptacles on rooftops shall not be required to be readily accessible

other than from the rooftop.

Exception No. 3: ~~In~~Receptacles or cord-and-plug-connected fixed and stationary appliances installed within 1.8 m (6 ft) from the top inside edge of a bowl of a sink shall not be required to be GFCI protected in industrial establishments ~~only,~~ where the conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program in accordance with 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power is interrupted or that has a design not compatible with GFCI protection.

Exception No. 4: Receptacles or cord-and-plug-connected fixed and stationary appliances installed within 1.8 m (6 ft) from the top inside edge of a bowl of a sink shall not be required to be GFCI protected in industrial laboratories where the receptacles are used to supply equipment if removal of power would introduce a greater hazard.

Exception No. 5: Receptacles located in patient bed locations of Category 2 (general care) or Category 1 (critical care) spaces of health care facilities shall be permitted to comply with 517.21.

Exception No. 6: Listed ~~locking support and mounting~~weight-supporting ceiling receptacles ~~used~~(WSCR) utilized in combination with compatible weight-supporting attachment fittings (WSAF) installed for the purpose of serving a ceiling luminaire or ceiling-suspended fan shall ~~not~~ be ~~required to be GFCI protected~~permitted to omit GFCI protection. If a general-purpose convenience receptacle is integral to the ceiling luminaire or ceiling-suspended fan, GFCI protection shall be provided.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR7958_210.8_B_.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 14:20:16 EDT 2021

Committee Statement

Committee Statement: All exceptions were moved to the end of 210.8(B) and renumbered, as required by the Style Manual. Exception No. 1 no longer refers to specific list items, as it does not matter where the receptacles are installed. The terms for the locking support and mounting receptacle were revised to align with terminology defined in Article 100. Exception No. 6 is no longer only applicable to specific list items as the exception would apply regardless of location.

Expanding 210.8(B) beyond a 50A single phase receptacle was not accepted due to lack of substantiation. The panel rejected single-phase and three-phase changes and rejected going beyond 50A single-phase.

The reference to single-phase was not removed. The language in this section only applies to 120 V through 240 V receptacles that are supplied by branch circuits 150 V or less to ground.

***

The revision to item (7) is balloted separately on SR-7950.

Response Message: SR-7958-NFPA 70-2021

Public Comment No. 260-NFPA 70-2021 [Section No. 210.8(B)]

Second Revision No. 7966-NFPA 70-2021 [Section No. 210.8(D)]

(D) Specific Appliances.

GFCI protection shall be provided for the branch circuit or outlet supplying the following appliances rated 150 volts or less to ground and 60 amperes or less, single- or 3-phase:

(1) Automotive vacuum machines

(2) Drinking water coolers and bottle fill stations

(3) ~~Cord-and-plug-connected high~~ High -pressure spray washing machines

(4) Tire inflation machines

(5) Vending machines

(6) Sump pumps

(7) Dishwashers

(8) Electric ranges

(9) Wall-mounted ovens

(10) Counter-mounted cooking units

(11) Clothes dryers

(12) Microwave ovens

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 14:58:59 EDT 2021

Committee Statement

Committee Statement: The referenced cooking appliances in the comment were added to 210.8(D).

Due to the nature of the hazard with these installations. This requirement was placed in 210.8(D) to address all outlets and not be limited to only receptacle outlets found in 210.8(A).

Section 210.8(D) now includes new list items (8) through (12), as these are sometimes hard wired to outlets and would not be a part of the GFCI requirements found for receptacles in laundry areas as part of 210.8(A) and 210.8(B). The shock hazard does not go away due to hard wired versus cord-and-plug connected equipment.

Response Message: SR-7966-NFPA 70-2021

Public Comment No. 1343-NFPA 70-2021 [Section No. 210.8(A)]

Second Revision No. 7971-NFPA 70-2021 [Section No. 210.8(F)]

(F) Outdoor Outlets.

For dwellings, all outdoor outlets ~~rated 125 volts through 250 volts~~ , other than those covered in 210.8(A) , Exception No. 1 , including outlets installed in the following locations, and supplied by single-phase branch circuits rated 150 volts or less to ground, 50 amperes or less, shall be provided with GFCI protection:

(1) Garages that have floors located at or below grade level

(2) Accessory buildings

(2) ~~All outdoor outlets for dwellings other than those covered in 210.8(A), Exception No. 1~~

(3) Boathouses

~~Where~~ If equipment supplied by an outlet covered under the requirements of this section is replaced, the outlet shall be supplied with GFCI protection.

Exception: GFCI protection shall not be required on lighting outlets other than those covered in 210.8(C).

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Mon Oct 18 15:28:29 EDT 2021

Committee Statement

Committee Statement: Because outlets do not have a rating, this section was reworded to properly address the fact that it is the branch circuit that has a rating.

210.8(F)(3) was relocated to the parent text of 210.8(F) and the list items were renumbered in this section.

The word “where” was replaced with “if” to align with the style manual 3.3.4 for proper use of the term.

The suggested addition of dwellings into the title of 210.8(F) was not added, as it is currently located in the first paragraph and not necessary to be added here.

The suggested changes to add a list item for dwellings and modify the exception were not accepted as they do not add clarity. The existing exception referencing 210.8(C) is appropriate and the suggested change would vastly expand the exception without substantiation. Utilization was not added, as it is more limiting without proper substantiation.

Response Message: SR-7971-NFPA 70-2021

Public Comment No. 262-NFPA 70-2021 [Section No. 210.8(F)]

Second Revision No. 8140-NFPA 70-2021 [Section No. 210.8 [Excluding any Sub-Sections]]

A listed Class A GFCI shall provide protection in accordance with 210.8(A) through (F). The GFCI shall be installed in a readily accessible location.

Informational Note: See 215.9 for GFCI protection on feeders.

~~Informational Note No. 2: See 422.5(A) for GFCI requirements for appliances.~~

~~Informational Note No. 3: See 555.35(F) for GFCI requirements for boat hoists.~~

~~Informational Note No. 4: Additional GFCI requirements for specific circuits and equipment are contained in Chapters 4 , 5 , and 6 .~~

For the purposes of this section, the distance from receptacles shall be measured as the shortest path the power supply cord connected to the receptacle would follow without piercing a floor, wall, ceiling, or fixed barrier.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR7934_210.8_Excluding_Subs.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Thu Oct 21 14:57:52 EDT 2021

Committee Statement

Committee Statement: Informational Note No. 2 was deleted as it is not required. Just as in many other cases, other articles can include GFCI protection but are not pointed to in Section 210.8. The GFCI requirements of Article 422 do not amend the requirements found in Section 210.8.

Informational Note No. 3 was deleted as it was originally included as a reminder that these requirements were moved to Article 555. GFCI protection is no longer required.

Informational Note No. 4 was deleted as it is no longer necessary and does not comply with the Style Manual in that it references entire Chapters.

Response Message: SR-8140-NFPA 70-2021

Public Comment No. 618-NFPA 70-2021 [Section No. 210.8]

Second Revision No. 8203-NFPA 70-2021 [Section No. 210.12]

210.12 Arc-Fault Circuit-Interrupter Protection.

Arc-fault circuit-interrupter (AFCI) protection shall be installed in accordance with 210.12(B) through ~~(F)~~ (E) by any of the means described in 210.12(A)(1) through (A)(6). The AFCI shall be listed and installed in a readily accessible location.

(A) Means of Protection.

AFCI protection shall be provided by any of the following means:

(1) A listed combination-type AFCI installed to provide protection of the entire branch circuit.

(2) A listed branch/feeder-type AFCI installed at the origin of the branch circuit in combination with a listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet box, ~~on the branch circuit. The first outlet box in the branch circuit~~ which shall be marked to indicate that it is the first outlet of the branch circuit.

(3) A listed supplemental arc protection circuit breaker installed at the origin of the branch circuit in combination with a listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet box ~~on the branch circuit where~~ if all of the following conditions are met:

a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit AFCI.

b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.

c. The first outlet box ~~in the branch circuit~~ shall be marked to indicate that it is the first outlet of the branch circuit.

(4) A listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet ~~on the branch circuit~~ in combination with a listed branch-circuit overcurrent protective device ~~where~~ if all of the following conditions are met:

a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit AFCI.

b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.

c. The first outlet box ~~in the branch circuit~~ shall be marked to indicate that it is the first outlet of the branch circuit.

d. The combination of the branch-circuit overcurrent device and outlet branch-circuit AFCI shall be identified as meeting the requirements for a system combination-type AFCI and listed as such.

(5) If metal raceway, metal wireways, metal auxiliary gutters, or Type MC or Type AC cable meeting the applicable requirements of 250.118, with metal boxes, metal conduit bodies, and metal enclosures are installed for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed outlet branch-circuit-type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

(6) Where a listed metal or nonmetallic conduit or tubing or Type MC cable is encased in not less than 50 mm (2 in.) of concrete for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed outlet branch-circuit-type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

Informational Note: See UL 1699-2011, *Standard for Arc-Fault Circuit-Interrupters*, for information on combination-type and branch/feeder-type AFCI devices. See UL Subject 1699A, *Outline of Investigation for Outlet Branch Circuit Arc-Fault Circuit-Interrupters*, for information on outlet branch-circuit type AFCI devices. See UL Subject 1699C, *Outline of Investigation for System Combination Arc-Fault Circuit Interrupters*, for information on system combination AFCIs.

Detail SR-8204

Detail SR-8019

(B) Dwelling Units.

All 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying outlets or devices installed in the following locations shall be protected by any of the means described in 210.12(A)(1) through (A)(6):

(1) Kitchens

(2) Family rooms

(3) Dining rooms

(4) Living rooms

(5) Parlors

(6) Libraries

(7) Dens

(8) Bedrooms

(9) Sunrooms

(10) Recreation rooms

(11) Closets

(12) Hallways

(13) Laundry areas

(14) Garages. This requirement shall become effective January 1, 2025.

(15) Bathrooms. This requirement shall become effective January 1, 2025.

(16) Similar areas

Exception No. 1: AFCI protection shall not be required for an individual branch circuit supplying a fire alarm system installed in accordance with 760.41(B) or 760.121(B). The branch circuit shall be installed in a metal raceway, metal auxiliary gutter, steel-armored cable, or Type MC or Type AC cable meeting the applicable requirements of 250.118, with metal boxes, conduit bodies, and enclosures.

Exception No. 2: AFCI protection shall not be required for the individual branch circuit supplying ~~a receptacle~~ an outlet for arc welding equipment in a dwelling unit ~~effective~~ until January 1, 2025.

~~Informational Note No. 1: See UL 1699-2011, *Standard for Arc-Fault Circuit-Interrupters*, for information on combination-type and branch/feeder-type AFCI devices. See UL Subject 1699A, *Outline of Investigation for Outlet Branch Circuit Arc-Fault Circuit-Interrupters*, for information on outlet branch-circuit type AFCI devices. See UL Subject 1699C, *Outline of Investigation for System Combination Arc-Fault Circuit Interrupters*, for information on system combination AFCIs.~~

Informational Note No. 1: See 29.9.4(5) of *NFPA 72*-~~2019~~2022, *National Fire Alarm and Signaling Code*, for information on secondary power source requirements for smoke alarms installed in dwelling units.

Informational Note No. 2: See 760.41(B) and 760.121(B) for power source requirements for fire alarm systems.

Detail SR-8205

(C) Dormitory Units.

All 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying outlets or devices installed in the following locations shall be protected by any of the means described in 210.12(A)(1) through (A)(6):

(1) Bedrooms

(2) Living rooms

(3) Hallways

(4) Closets

(5) Bathrooms

(6) Similar rooms

Detail SR-8206

(D) Other Occupancies.

All 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying outlets or devices installed in ~~guest rooms and guest suites of hotels and motels, and in areas used exclusively as patient sleeping rooms in nursing homes and limited-care facilities~~the following locations shall be protected by any of the means described in 210.12(A)(1) through (A)(6):

(1) Guest rooms and guest suites of hotels and motels

(2) Areas used exclusively as patient sleeping rooms in nursing homes and limited-care facilities

(3) Areas designed for use exclusively as sleeping quarters in fire stations, police stations, ambulance stations, rescue stations, ranger stations, and similar locations

(E) Branch Circuit Wiring Extensions, ~~or~~ Modifications, or Replacements .

~~Where~~ If branch-circuit wiring for any of the areas specified in 210.12(B), (C), or (D) is modified, replaced, or extended, the branch circuit shall be protected by one of the following:

(1) By any of the means described in 210.12(A)(1) through (A)(6)

(2) A listed outlet branch-circuit-type AFCI located at the first receptacle outlet of the existing branch circuit

Exception: AFCI protection shall not be required where the extension of the existing branch-circuit conductors is not more than 1.8 m (6 ft) and does not include any additional outlets or devices, other than splicing devices. This measurement shall not include the conductors inside an enclosure, cabinet, or junction box.

~~**(F)** Sleeping Quarters.~~

~~All 120-volt, single-phase, 15 and 20-ampere branch circuits supplying outlets or devices installed in rooms designed exclusively for sleeping in fire houses, rescue squads, police departments, and similar locations shall be protected by any of the means described in 210.12(A)(1) through (A)(6).~~

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8203_210.12.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Fri Oct 22 18:41:25 EDT 2021

Committee Statement

Committee Statement: Rewording of 210.12 throughout for grammatical accuracy and clarity.

210.12(A)(3), 210.12(A)(4), and 210.12(A)(6) do not conform with 2020 NEC® Style Manual 3.3.4 for word clarity using “where” instead of correct “if” for conditions.

210.12(A) addresses the means of AFCI protection whereas 210.12(B) addresses the locations of a dwelling unit required to have AFCI protection. The FR does not comply with 2020 NEC® Style Manual 3.1.3 (Informational notes contain explanatory information and shall be located directly after the rule they apply to). Accordingly, 210.12(B) Informational Note No 1 pertaining to the means of AFCI protection is relocated directly after 210.12(A), as 210.12(A) Informational Note. The remaining Informational Notes in 210.12(B) are renumbered accordingly.

In 210.12(A) Informational Note, the cited standard UL 1699-2011 is now designated as ANSI/UL 1699-2020.

210.12(B) Exception No 2 is rewritten to clarify the exception expires January 1, 2025.

210.12(F) has been moved to 210.12(D) as these may be locations within other occupancies. The descriptions of these areas have been changed to align with other NFPA documents for clarity.

***

The addition of 'Bathrooms' in 210.12(B) is balloted separately on SR-8204.

The addition of 'Garages' in 210.12(B) is balloted separately on SR-8019.

The addition of 10-ampere branch circuits to 210.12(C) is balloted separately on SR-8205.

The addition of 10-ampere branch circuits to 210.12(D) is balloted separately on SR-8206.

Response Message: SR-8203-NFPA 70-2021

Public Comment No. 2180-NFPA 70-2021 [Section No. 210.12]

Public Comment No. 1760-NFPA 70-2021 [Section No. 210.12(F)]

Second Revision No. 8035-NFPA 70-2021 [Section No. 210.13]

210.13 Ground-Fault Protection of Equipment.

Each branch-circuit disconnect rated 1000 amperes or more and installed on solidly grounded wye electrical systems of more than 150 volts to ground, but not exceeding 1000 volts phase-to-phase, shall be provided with ground-fault protection of equipment in accordance with 230.95.

Informational Note: See 517.17 for requirements on buildings that contain health care occupancies.

Exception No. 1: This section shall not apply to a disconnecting means for a continuous industrial process where a nonorderly shutdown will introduce additional or increased hazards.

Exception No. 2: This section shall not apply if ground-fault protection of equipment is provided on the supply side of the branch circuit and on the load side of any transformer supplying the branch circuit.

Exception No. 3: For fused disconnects, where the available fault current is 10,000 amperes or greater, the ground-fault protection provisions of this section shall not apply if the fused disconnect complies with 240.67(B) (1) or (B)(3) and is set to operate at the lower of the calculated minimum arcing current or 38 percent of the available fault current.

Exception No. 4: For circuit breakers, where the available fault current is 10,000 amperes or greater, the ground-fault protection provisions of this section shall not apply if the circuit breaker complies with 240.87(B) (2) or (4) and is set to operate at the lower of the calculated minimum arcing current or 38 percent of the available fault current.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 15:57:28 EDT 2021

Committee Statement

Committee Statement: These exceptions recognize the extended level of protection provided by technologies that monitor the condition of equipment and act to protect should a fault occur in the equipment. The provisions of 240.67 and 240.87 that are always on and active include differential relaying and the active arc flash mitigation system. Other methods are recognized in 240.87 and 240.67 but were not included here as the Panel did not feel comfortable without some additional level of technology at these locations other than the standard overcurrent protective device inverse time current characteristics. These exceptions will help increase safety through the application of a higher level of state-of-the-art technologies other than GFPE which is permitted to have a 1-second time delay and could leave the equipment vulnerable to heavy equipment damage. The response times of differential relaying and active arc flash mitigation systems are extremely fast and have been proven to provide protection of the equipment within which they are installed and designed to protect.

Response Message: SR-8035-NFPA 70-2021

Public Comment No. 314-NFPA 70-2021 [Section No. 210.13]

Second Revision No. 8038-NFPA 70-2021 [Section No. 210.15]

210.2 Reconditioned Equipment.

~~Reconditioned equipment shall be listed as "reconditioned" and the original listing mark removed.~~ The following shall not be reconditioned:

(1) Equipment that provides ground-fault circuit-interrupter protection for personnel

(2) Equipment that provides arc-fault circuit-interrupter protection

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 16:29:50 EDT 2021

Committee Statement

Committee Statement: The text has been modified to eliminate redundant language in accordance with NEC Style Manual Section 4.1.1. The requirements for reconditioned equipment have been moved to XXX.2, as recommended by the Correlating Committee.

Response Message: SR-8038-NFPA 70-2021

Public Comment No. 634-NFPA 70-2021 [Section No. 210.15]

Second Revision No. 8039-NFPA 70-2021 [Section No. 210.18]

210.18 Rating.

Branch circuits recognized by this article shall be rated in accordance with the maximum permitted ampere rating or setting of the overcurrent device. The rating for other than individual branch circuits shall be 10, 15, 20, 30, 40, and 50 amperes. Where conductors of higher ampacity are used for any reason, the ampere rating or setting of the specified overcurrent device shall determine the circuit rating.

Exception No. 1: Multioutlet branch circuits greater than 50 amperes shall be permitted to supply nonlighting outlet loads in locations where conditions of maintenance and supervision ensure that only qualified persons service the equipment.

Exception No. 2: Branch circuits rated 10 amperes shall not ~~be permitted to~~ supply receptacle outlets.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 16:38:44 EDT 2021

Committee Statement

Committee Statement: The text “shall not be permitted to” has been changed to “shall not” to comply with 3.1.1 of the NEC Style Manual.

The exception is properly located and used, and exceptions are allowed to contain mandatory language, given the conditions within the exception.

Response Message: SR-8039-NFPA 70-2021

Public Comment No. 22-NFPA 70-2021 [Section No. 210.18]

Second Revision No. 8042-NFPA 70-2021 [Section No. 210.19 [Excluding any Sub-Sections]]

Branch-circuit conductors for circuits not ~~more than~~ exceeding 1000 volts ac or 1500 volts dc shall be sized in accordance with 210.19(A) through (D).

Informational Note: Conductors for branch circuits as defined in Article 100, sized to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combinations of such loads, and where the maximum total voltage drop on both feeders and branch circuits to the farthest outlet does not exceed 5 percent, provide reasonable efficiency of operation. See Informational Note No. 2 of 215.2(A)(2) for information on voltage drop on feeder conductors.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 16:51:07 EDT 2021

Committee Statement

Committee Statement: The text has been changed to clarify that the voltage limitation is intended to apply to the circuit, not the conductor's insulation rating.

1500 volts dc has been added to align with the proposed new Article 235.

Response Message: SR-8042-NFPA 70-2021

Public Comment No. 1302-NFPA 70-2021 [Section No. 210.19]

Public Comment No. 284-NFPA 70-2021 [Section No. 210.19 [Excluding any Sub-Sections]]

Second Revision No. 8207-NFPA 70-2021 [Section No. 210.20 [Excluding any Sub-Sections]]

Branch-circuit conductors and equipment for circuits not exceeding 1000 volts ac or 1500 volts dc shall be protected by overcurrent protective devices that have a rating or setting that complies with 210.20(A) through (D).

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 10:51:54 EDT 2021

Committee Statement

Committee Statement: 1500 volts dc has been added to align with the proposed new Article 235. The circuit rating is addressed rather than the conductor rating to provide clarity. The rating of the circuit is used to determine the application of NEC requirements.

Response Message: SR-8207-NFPA 70-2021

Public Comment No. 1303-NFPA 70-2021 [Section No. 210.20]

Second Revision No. 8045-NFPA 70-2021 [Section No. 210.23(A)(1)]

(1) Loads Permitted for 10-Ampere Branch Circuits.

A 10-ampere branch circuit shall be permitted to supply one or more of the following:

(1) Lighting outlets

(2) Dwelling unit exhaust fans on bathroom or laundry room lighting circuits

(3) ~~Gas fireplace igniter and fan where the~~ A gas fireplace ~~is on~~ unit supplied by an individual branch circuit

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 17:24:02 EDT 2021

Committee Statement

Committee Statement: List item (3) has been revised to clarify that the requirement applies to a gas fireplace regardless of its features and to comply with NEC Style Manual 3.3.3.

Response Message: SR-8045-NFPA 70-2021

Public Comment No. 237-NFPA 70-2021 [Section No. 210.23(A)(1)]

Second Revision No. 8046-NFPA 70-2021 [Section No. 210.23(A)(2)]

(2) Loads Not Permitted for 10-Ampere Branch Circuits.

A 10-ampere branch circuit shall not ~~be permitted for~~ supply any of the following:

(1) ~~Supplying receptacle~~ Receptacle outlets

(2) ~~Supplying fixed~~ Fixed appliances, except as permitted for individual branch circuits

(3) ~~Supplying garage~~ Garage door openers

(4) ~~Supplying laundry~~ Laundry equipment

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 17:30:38 EDT 2021

Committee Statement

Committee Statement: The first sentence has been modified to remove redundant text and to comply with NEC Style Manual 3.1.1.

Response Message: SR-8046-NFPA 70-2021

Public Comment No. 242-NFPA 70-2021 [Section No. 210.23(A)(2)]

Second Revision No. 8049-NFPA 70-2021 [Section No. 210.24]

210.24 Branch-Circuit Requirements — Summary.

The requirements for circuits that have two or more outlets or receptacles, other than the receptacle circuits of 210.11(C)(1), (C)(2), and (C)(3), are summarized in Table 210.24(1) for copper conductors and ~~Table 210.24(b)~~ Table 210.24(2) for aluminum and copper-clad aluminum conductors. Table 210.24(1) and ~~Table 210.24(b)~~ Table 210.24(2) provide only a summary of minimum requirements. See 210.19, 210.20, and 210.21 for the specific requirements applying to branch circuits.

Table 210.24(1) Summary of Branch-Circuit Requirements — Copper Conductors

Circuit Rating	**10 A**	**15 A**	**20 A**	**30 A**	**40 A**	**50 A**
Conductors (min. size):				~~cc~~		
Circuit wires[1]	~~14~~ 16	14	12	10	8	6
Taps	~~14~~ 16	14	14	14	12	12
Fixture wires and cords			See 240.5.			
Overcurrent Protection	**10 A**	**15 A**	**20 A**	**30 A**	**40 A**	**50 A**
Outlet devices:						
Lampholders permitted	Any type	Any type	Any type	Heavy duty	Heavy duty	Heavy duty
Receptacle rating[~~2~~ 1]	~~See note 2.~~ Not applicable [2]	15 max. A	15 A or 20 A	30 A	40 A or 50 A	50 A
Maximum Load	**10 A**	**15 A**	**20 A**	**30 A**	**40 A**	**50 A**
Permissible load	See 210.23(A).	See 210.23(B).	See 210.23(B).	See 210.23(C).	See 210.23(D).	See 210.23(D).

[1]For receptacle rating of cord-connected electric-discharge luminaires, see 410.62(C).

[2]Branch circuits rated 10-amperes shall not ~~be permitted to~~ supply ~~receptacles~~ receptacle outlets .

Table 210.24(2) Summary of Branch-Circuit Requirements — Aluminum and Copper-Clad Aluminum Conductors

Circuit Rating	**10 A[1]**	**15 A**	**20 A**	**30 A**	**40 A**	**50 A**
Conductors (min. size):						
Circuit wires	14[1]	12	10	8	6	4
Taps	14[1]	12	12	12	10	10
Fixture wires and cords				See 240.5.		
Overcurrent Protection	**10 A[1]**	**15 A**	**20 A**	**30 A**	**40 A**	**50 A**
Outlet devices:						
Lampholders permitted	Any type	Any type	Any type	Heavy duty	Heavy duty	Heavy duty
Receptacle rating[2]	~~See note 3.~~ Not applicable [3]	15 max. A	15 A or 20 A	30 A	40 A or 50 A	50 A
Maximum Load	**10 A[1]**	**15 A**	**20 A**	**30 A**	**40 A**	**50 A**

Circuit Rating	10 A[1]	15 A	20 A	30 A	40 A	50 A
Permissible load	See 210.23(A).	See 210.23(B).	See 210.23(B).	See 210.23(C).	See 210.23(D).	See 210.23(D).

[1]Copper-clad aluminum conductors only.

[2]For receptacle rating of cord-connected electric-discharge luminaires, see 410.62(C).

[3]Branch circuits rated 10-amperes shall not ~~be permitted to~~ supply ~~receptacles~~ receptacle outlets .

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8049_210.24.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Tue Oct 19 17:41:15 EDT 2021

Committee Statement

Committee Statement: 14 AWG copper has been changed to 16 AWG copper conductors and are now allowed on 10-ampere rated branch circuits. This aligns with actions taken by CMP 6 during the first draft of 2023 NEC and correlates with existing 240.4(D)(2).

Editorial changes were made to the footnotes and footnote references to correct editorial errors in the first draft.

Response Message: SR-8049-NFPA 70-2021

Public Comment No. 1769-NFPA 70-2021 [Section No. 210.24]

Public Comment No. 54-NFPA 70-2021 [Section No. 210.24]

Second Revision No. 8090-NFPA 70-2021 [Section No. 210.52(C)]

Detail SR-8210

(C) Countertops and Work Surfaces.

In kitchens, pantries, breakfast rooms, dining rooms, and similar areas of dwelling units, receptacle outlets for countertop and work surfaces that are 300 mm (12 in.) or wider shall be installed in accordance with 210.52(C)(1) through (C)~~(4)~~ (3) and shall not be considered as the receptacle outlets required by 210.52(A).

For the purposes of this section, where using multioutlet assemblies, each 300 mm (12 in.) of multioutlet assembly containing two or more receptacles installed in individual or continuous lengths shall be considered to be one receptacle outlet.

~~**(1)**~~

~~For the purposes of this section, receptacles installed in accordance with either of the following shall be considered as one receptacle outlet:~~

(0) ~~Each 300 mm (12 in.) of multioutlet assembly containing two or more receptacles installed in individual or continuous lengths~~

(0) ~~Each two receptacles installed in the same device box~~

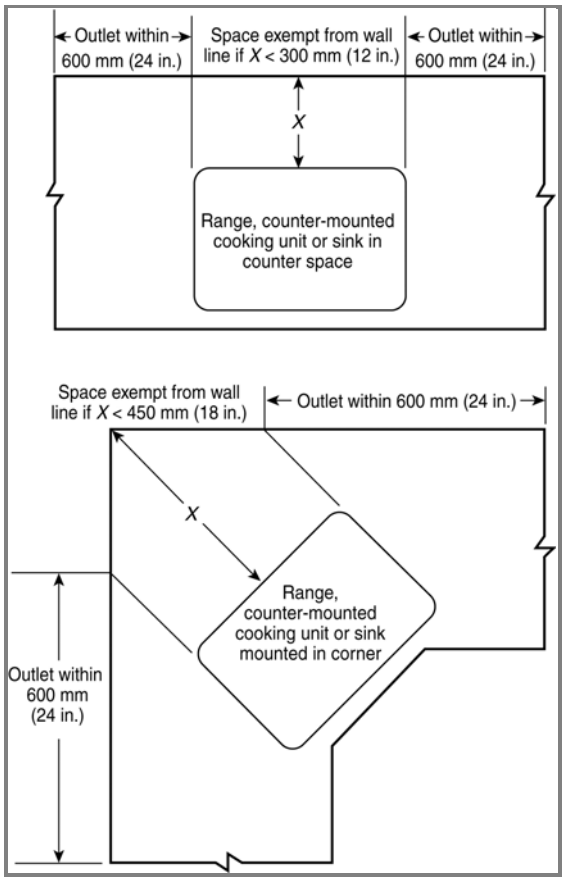
(1) Wall Spaces.

Receptacle outlets shall be installed so that no point along the wall line is more than 600 mm (24 in.) measured horizontally from a receptacle outlet in that space. The location of the receptacles shall be in accordance with 210.52(C)(3).

Exception No. 1: Receptacle outlets shall not be required directly behind a range, counter-mounted cooking unit, or sink in the installation described in Figure 210.52(C)(1).

Exception No. 2: Where a required receptacle outlet cannot be installed in the wall areas shown in Figure 210.52(C)(1), the receptacle outlet shall be permitted to be installed as close as practicable to the countertop area to be served. The total number of receptacle outlets serving the countertop shall not be less than the number needed to satisfy 210.52(C)(1). These outlets shall be located in accordance with 210.52(C)(3).

Figure 210.52(C)(1) Determination of Area Behind a Range, Counter-Mounted Cooking Unit, or Sink.



Detail SR-8209

(2) Island and Peninsular Countertops and Work Surfaces.

Receptacle outlets, if installed to serve an island or peninsular countertop or work surface, shall be installed in accordance with ~~210.52(C)(3)(a) and (C)(3)(b)~~210.52(C)(3). If a receptacle outlet is not provided to serve an island or peninsular countertop or work surface, provisions shall be provided at the island or peninsula for future addition of a receptacle outlet to serve the island or peninsular countertop or work surface.

(0) ~~*Locations with Countertop or Work Surface Wall Spaces.* At least one receptacle outlet shall be installed where the location is also provided with countertops or work surfaces totaling more than 1.2 linear m (4 linear ft).~~

(0) ~~*Locations without Countertop or Work Surface Wall Spaces*. Receptacle outlets shall be installed in accordance with one of the following. Receptacle outlets shall be permitted to be located as determined by the installer, designer, or building owner.~~

~~Where a peninsular countertop is connected to a wall countertop, the peninsular countertop shall be measured from the connected wall countertop. Where a peninsular countertop is connected to a wall, the peninsular countertop shall be measured from the wall.~~

Detail SR-8208

(3) Receptacle Outlet Location.

Receptacle outlets shall be located in one or more of the following:

(1) ~~On or above countertop or work surfaces:~~ On or above, but not more than 500 mm (20 in.) above, ~~countertops~~a countertop or work ~~surfaces.~~surface

(2) In a countertop ~~or work surfaces: Receptacle outlet assemblies listed for use in countertops or work surfaces shall be permitted to be installed in countertops or work surfaces.~~using receptacle outlet assemblies listed for use in countertops

(3) ~~Below countertop or works surfaces: Not more than 300 mm (12 in.) below countertops or work surfaces. Receptacles installed below a countertop or work surface shall not be located where the countertop or work surface extends more than 150 mm (6 in.) beyond the face of such receptacles.~~ In a work surface using receptacle outlet assemblies listed for use in work surfaces or listed for use in countertops

Receptacle outlets rendered not readily accessible by appliances fastened in place, appliance garages, sinks, or rangetops as covered in 210.52(C)(1), Exception No. 1, or appliances occupying assigned spaces shall not be considered as these required outlets.

Informational Note No. 1: See 406.5(E) and ~~406.5(G)~~ for installation of receptacles in countertops and 406.5(F) and ~~406.5(G)~~ for installation of receptacles in work surfaces. See 380.10 for installation of multioutlet assemblies.

Informational Note No. 2: See Informative Annex J and ANSI/ICC A117.1-2009, *Standard on Accessible and Usable Buildings and Facilities*.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8090_210.52_C_.docx	staff use - changes to be balloted as SR-8090	
NEC_CMP02_SR8090_210.52_C_All.docx	staff use - for reference, shows text with all detail revisions (SR-8208, SR-8209, and SR-8210) applied	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 15:53:42 EDT 2021

Committee Statement

Committee Statement: Data sets compiled by CPSC epidemiologists show that there were 45 anecdotal reports of burn/other injuries between Jan 1991 through 2020, as well as an estimated 9,700 burn/other injuries treated in U.S. hospital emergency departments. The data sets indicate that the injuries were caused by tipping and spilling the contents of countertop cooking appliances, many of which specifically involved children pulling on the appliance cord. Many of these incidents involved second- and third-degree burn injuries; and 10 resulted in death, including the deaths of infants as young as 8 months of age. The investigations revealed that children may pull power cords, or the cords may get snagged inadvertently when a person is walking by. The data sets presented here are reported incidents in CPSC databases, and the number of actual burns on a national scale is likely much greater.

The requirement for receptacles serving the countertop or work surface of an island or peninsula is made optional, but guidance for location is maintained when they are provided.

Exception No. 2 under 'Wall Spaces' has also been added to help the installer where a surface behind a sink is not available for a receptacle to be installed.

***

The deletion of 210.52(C)(1) and restoration of the text in the charging paragraph is balloted separately on SR-8210.

The addition of a new requirement to provide provision for a future outlet if one is not installed to serve an island or peninsular countertop or work surface is balloted separately on SR-8209.

The revision of Informational Note #2 in 210.52(C)(4) is balloted separately on SR-8208.

Response Message: SR-8090-NFPA 70-2021

Public Comment No. 222-NFPA 70-2021 [Section No. 210.52(C)(3)]

Public Comment No. 1097-NFPA 70-2021 [Sections 210.52(C)(2), 210.52(C)(3), 210.52(C)(4)]

Public Comment No. 737-NFPA 70-2021 [Section No. 210.52(C)(4)]

Public Comment No. 1954-NFPA 70-2021 [Section No. 210.52(C)(3)]

Public Comment No. 660-NFPA 70-2021 [Section No. 210.52(C)]

Second Revision No. 8211-NFPA 70-2021 [Section No. 210.52(E) [Excluding any Sub-Sections]]

Outdoor receptacle outlets shall be installed in accordance with 210.52(E)(1) through (E)(3).

~~Informational Note: See 210.8(A)(3).~~

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 13:08:12 EDT 2021

Committee Statement

Committee Statement: The Committee has reviewed the informational note and decided it is no longer needed since 210.8 should always be consulted for GFCI protection requirements.

Response Message: SR-8211-NFPA 70-2021

Public Comment No. 852-NFPA 70-2021 [Section No. 210.52(E)]

Second Revision No. 8060-NFPA 70-2021 [Section No. 210.52(G) [Excluding any Sub-Sections]]

For one- and two-family dwellings, and multifamily dwellings, at least one receptacle outlet shall be installed in the areas specified in 210.52(G)(1) through (G)(3). These receptacles shall be in addition to receptacles required for specific equipment. Receptacles supplying only a permanently installed premises security system shall not be considered as meeting these requirements.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 11:51:12 EDT 2021

Committee Statement

Committee Statement: The change is being made to ensure that the required receptacles of 210.52(G) are afforded GFCI protection and not misconstrued as being meant to serve an installed premises security system.

Response Message: SR-8060-NFPA 70-2021 CMP-2

Second Revision No. 8061-NFPA 70-2021 [Section No. 210.62]

210.62 Show Windows.

At least one 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet shall be installed within 450 mm (18 in.) of the top of ~~a~~ each show window ~~for each 3.7 linear m (12 linear ft) or major fraction thereof of show window width measured horizontally at its maximum width.~~ . No point along the top of the window shall be farther than 1.8 m (6 ft) from a receptacle outlet.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 12:07:23 EDT 2021

Committee Statement

Committee Statement: The language has been revised for clarity.

Response Message: SR-8061-NFPA 70-2021

Public Comment No. 629-NFPA 70-2021 [Section No. 210.62]

Public Comment No. 1836-NFPA 70-2021 [Section No. 210.62]

Second Revision No. 8067-NFPA 70-2021 [Section No. 210.65(B)]

(B) Receptacle Outlets Required.

The total number of receptacle outlets, including floor outlets and receptacle outlets in fixed furniture, shall not be less than as determined in 210.65(B) (1) and (B) (2).

(1) Receptacle Outlets in Fixed Walls.

The required number of receptacle outlets shall be determined in accordance with 210.52(A)(1) through (A)(4). These receptacle outlets shall be permitted to be located as determined by the installer, designer, or building owner.

(2) Floor Outlets.

A meeting room with any floor dimension that is 3.7 m (12 ft) or greater in any direction and that has a floor area of at least 20 m^2 (215 ft^2) shall have at least one floor receptacle outlet, or at least one floor outlet to serve a receptacle(s), located at a distance not less than 1.8 m (6 ft) from any fixed wall for each 20 m^2 (215 ft^2) or ~~major portion of floor space~~ fraction thereof .

Informational Note No. 1: See 314.27(B) for requirements on floor boxes used for receptacles located in the floor.

Informational Note No. 2: See 518.1 for requirements on assembly occupancies designed for 100 or more persons.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 12:32:57 EDT 2021

Committee Statement

Committee Statement: The phrase “or major portion of floor space” is replaced with “or fraction thereof” to show that the requirement is to have one floor outlet for each 20 sq. m (215 sq. ft) meeting room space or smaller.

Response Message: SR-8067-NFPA 70-2021

Public Comment No. 630-NFPA 70-2021 [Section No. 210.65(B)]

Second Revision No. 8212-NFPA 70-2021 [Section No. 210.70(A)(1)]

(1) Habitable Rooms, Kitchens, Laundry Areas, and Bathrooms .

At least one lighting outlet controlled by a listed wall-mounted control device shall be installed in every habitable room, kitchen, laundry area, and bathroom. The wall-mounted control device shall be located near an entrance to the room on a wall.

Exception No. 1: In other than kitchens, laundry areas, and bathrooms, one or more receptacles controlled by a listed wall-mounted control device shall be permitted in lieu of lighting outlets.

Exception No. 2: Lighting outlets shall be permitted to be controlled by occupancy sensors that are (1) in addition to listed wall-mounted control devices or (2) located at a customary wall switch location and equipped with a manual override that will allow the sensor to function as a wall switch.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 13:29:55 EDT 2021

Committee Statement

Committee Statement: The title has been changed to reflect the areas addressed in this section of the NEC. Kitchens, laundry areas, and bathrooms are not habitable areas.

Response Message: SR-8212-NFPA 70-2021

Public Comment No. 631-NFPA 70-2021 [Section No. 210.70(A)]

Second Revision No. 8213-NFPA 70-2021 [Section No. 210.70(A)(2)]

(2) Additional Locations.

Additional lighting outlets shall be installed in accordance with the following:

(1) At least one lighting outlet controlled by a listed wall-mounted control device shall be installed in hallways, stairways, attached garages, detached garages, and accessory buildings with electric power.

(2) For dwelling units, attached garages, and detached garages with electric power, at least one exterior lighting outlet controlled by a listed wall-mounted control device shall be installed to provide illumination on the exterior side of outdoor entrances or exits with grade-level access. A vehicle door in a garage shall not be considered as an outdoor entrance or exit.

Exception to (2): For an outdoor, grade-level~~, sloped~~ bulkhead door with stairway access to a sub-grade-level basement, the required lighting outlet that provides illumination on the stairway steps shall be permitted to be located in the basement interior within 1.5 m (5 ft) horizontally of the bottommost stairway riser. This interior lighting outlet shall be permitted to be controlled by a listed wall-mounted control device or by a unit switch of the interior luminaire or interior lampholder.

(3) Where lighting outlets are installed for an interior stairway with six or more risers between floor levels, there shall be a listed wall-mounted control device at each floor level and at each landing level that includes a stairway entry to control the lighting outlets.

Exception to (1), (2), and (3): Remote, central, or automatic control of lighting shall be permitted in hallways, in stairways, and at outdoor entrances.

(4) Dimmer control of lighting outlets installed in accordance with 210.70(A)(2)(3) shall not be permitted unless the listed control devices can provide dimming control to maximum brightness at each control location for the interior stairway illumination.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 13:37:31 EDT 2021

Committee Statement

Committee Statement: The word sloped is being removed because there are areas with flat, not sloped, sidewalk hatches that provide access to subgrade basements at dwelling units.

Response Message: SR-8213-NFPA 70-2021

Public Comment No. 535-NFPA 70-2021 [Section No. 210.70(A)(2)]

Second Revision No. 8093-NFPA 70-2021 [Section No. 220.1]

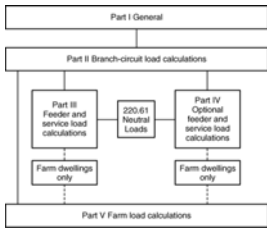
220.1 Scope.

This article provides requirements for calculating branch-circuit, feeder, and service loads. Part I provides general requirements for calculation methods. Part II provides calculation methods for branch-circuit loads. Parts III and Part IV provide calculation methods for feeder and service loads. Part V provides calculation methods for farm loads.

Informational Note No. 1: See examples in Informative Annex D for examples .

Informational Note No. 2: See Figure Informational Note 220.1 for information on the organization of Article 220 this article .

Figure Informational Note 220.1 Branch-Circuit, Feeder, and Service Load Calculation Methods.



Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 16:21:11 EDT 2021

Committee Statement

Committee Statement: Informational Note Nos. 1 and 2 are revised to comply with NEC Style Manual 4.1.3 and 4.1.4.

Response Message: SR-8093-NFPA 70-2021

Public Comment No. 854-NFPA 70-2021 [Section No. 220.1]

Second Revision No. 8105-NFPA 70-2021 [Section No. 220.3]

220.3 Other Articles for Specific-Purpose Calculations.

Table 220.3 shall provide references for specific-purpose calculation requirements not located in Chapters 5, 6, or 7 that amend or supplement the requirements of this article.

Table 220.3 Specific-Purpose Calculation References

Calculation	Article	Section (or Part)
Air-conditioning and refrigerating equipment, branch-circuit conductor sizing	440	Part IV
Capacitors	460	460.8
Fixed electric heating equipment for pipelines and vessels, branch-circuit sizing	427	427.4
Fixed electric space-heating equipment, branch-circuit sizing	424	424.3
Fixed outdoor electric deicing and snow-melting equipment, branch-circuit sizing	426	426.4
Fixed resistance and electrode industrial process heating equipment	425	425.4
Motors, feeder demand factor	430	430.26
Motors, multimotor and combination-load equipment	430	430.25
Motors, several motors or a motor(s) and other load(s)	430	430.24
Over ~~600~~ 1000 -volt ac and 1500-volt dc branch-circuit calculations	~~210~~ 235	~~210.19(B)~~ 235.19
Over ~~600~~ 1000 -volt feeder calculations	215	215.2(B)
Phase converters, conductors	455	455.6
Storage-type water heaters	422	422.11

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 17:47:56 EDT 2021

Committee Statement

Committee Statement: Table 220.3 is revised to align with new Article 235, which includes all of the requirements for branch circuits 1000 V ac or 1500 V dc.

This revision also modifies the voltage level reference for feeders moving 600 V to 1000 V, to align with the changes made in Article 215, which did the same.

Response Message: SR-8105-NFPA 70-2021

Public Comment No. 288-NFPA 70-2021 [Section No. 220.3]

Second Revision No. 8095-NFPA 70-2021 [Section No. 220.5(C)]

(C) Floor Area.

The floor area for each floor shall be calculated from the outside dimensions of the building, dwelling unit, or other area involved. For dwelling units, the calculated floor area shall not include open porches or unfinished areas not adaptable for future use as a habitable room or occupiable space .

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 16:25:40 EDT 2021

Committee Statement

Committee Statement: Those areas within a dwelling that can't be adapted for future use as a habitable room or occupiable space should not be considered when calculating loads.

The phrase "unfinished areas not adaptable for future use," as proposed in the comment, is too broad; however, specifying this provision to apply to "habitable rooms or occupiable spaces" establishes parameters for the requirement. Note that these terms have precedent, as they are also used in 404.2(C) for switches controlling lighting loads.

Response Message: SR-8095-NFPA 70-2021

Public Comment No. 1307-NFPA 70-2021 [Section No. 220.5(C)]

Second Revision No. 8214-NFPA 70-2021 [Section No. 220.10]

220.10 General.

Branch-circuit loads shall be calculated in accordance with the following sections:

(1) 220.14 for other loads — all occupancies

(2) 220.16 for additions to existing installations

(3) 220.41 for dwelling units

(4) 220.42 for lighting loads for non-dwelling occupancies

(5) 220.44 for hotel and motel occupancies

~~**(A)** Load Calculation.~~

~~Branch-circuit loads shall be calculated as shown in 220.14 , 220.17, 220.18, 220.19, and 220.20.~~

~~**(A)** Maximum Load.~~

~~The total load on a branch circuit shall not exceed the rating of the branch circuit and it shall not exceed the maximum loads specified in 220.10(B)(1) through (B)(3) under the conditions specified therein.~~

~~**(1)** Motor-Operated and Combination Loads.~~

~~Where a circuit supplies only motor-operated loads, the conductor sizing requirement specified in 430.22 shall apply. Where a circuit supplies only air-conditioning equipment, refrigerating equipment, or both, the requirements of 440.6 shall apply. For circuits supplying loads consisting of motor-operated utilization equipment that is fastened in place and has a motor larger than 1⁄8 hp in combination with other loads, the total calculated load shall be based on 125 percent of the largest motor load plus the sum of the other loads in accordance with 430.24.~~

~~**(2)** Inductive and LED Lighting Loads.~~

~~For circuits supplying lighting units that have ballasts, transformers, autotransformers, or LED drivers, the calculated load shall be based on the total ampere ratings of such units and not on the total watts of the lamps.~~

~~**(3)** Electric Cooking Appliances.~~

~~Applying demand factors for ranges, wall-mounted ovens, counter-mounted cooking units, and other household cooking appliance loads in excess of 1 3⁄4 kW shall be permitted in accordance with Table 220.55 , including Notes 4, 5, and 6.~~

220.11 Maximum Load.

The total load on a branch circuit shall not exceed the rating of the branch circuit ~~and it shall not exceed~~ nor the maximum loads specified in ~~220.10(B)(1)~~ 220.11(A) through ~~(B)(3)~~ (C) under the conditions specified therein.

(A) Motor-Operated and Combination Loads.

Where a circuit supplies only motor-operated loads, the conductor sizing requirement specified in 430.22 shall apply. Where a circuit supplies only air-conditioning equipment, refrigerating equipment, or both, the requirements of 440.6 shall apply. For circuits supplying loads consisting of motor-operated utilization equipment that is fastened in place and has a motor larger than 1⁄8 hp in combination with other loads, the total calculated load shall be based on 125 percent of the largest motor load plus the sum of the other loads in accordance with 430.24.

(B) Inductive and LED Lighting Loads.

For circuits supplying lighting units that have ballasts, transformers, autotransformers, or LED drivers, the calculated load shall be based on the total ampere ratings of such units and not on the total watts of the lamps.

(C) Electric Cooking Appliances.

Applying demand factors for ranges, wall-mounted ovens, counter-mounted cooking units, and other household cooking appliance loads in excess of 1¾ kW shall be permitted in accordance with Table 220.55, including Notes 4, 5, and 6.

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8214_220.10.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Sat Oct 23 14:51:12 EDT 2021

Committee Statement

Committee Statement: The Panel has rewritten the language of 220.10 to correlate with actions taken during the First Revision stage. Loads necessary for branch circuit calculations are included in the new list items under 220.10 General.

Section 220.10 is revised and restructured to identify the various requirements applied when calculating branch-circuit loads. The Panel's action during the First Draft relocated multiple sections to "Part III. Feeder and Service Load Calculations". While those relocated requirements do apply when calculating feeder and service load calculations, they are also applied when calculating branch-circuit loads. Rather than repeat requirements in both Parts II and III, a list is created in Section 220.10 that identifies all Sections within 220 that apply to branch-circuit load calculations. To improve usability, Section 220.10 is divided into two sections, with subsection (A) remaining as the "General" requirement (consistent with the scope of 220.10 in the 2020 NEC®) and subsection (B) moving to new Section 210.11, resulting in the renumbering and lettering of the subsections to reflect the text as a stand-alone Section.

Response Message: SR-8214-NFPA 70-2021

Public Comment No. 856-NFPA 70-2021 [Section No. 220.10(A)]

Second Revision No. 8111-NFPA 70-2021 [Section No. 220.14]

220.14 Other Loads — All Occupancies.

Branch-circuit load calculations shall include calculation of a minimum load on each outlet as calculated in 220.14(A) through (~~J~~ K) and then summed to establish the load on the branch circuit.

In all occupancies, the minimum load for each outlet for general-use receptacles and outlets not used for general illumination shall not be less than that calculated in 220.14(A) through ~~(J),~~ (K), with the loads shown being based on nominal branch-circuit voltages.

Exception: The loads of outlets serving switchboards and switching frames in telephone exchanges shall be waived from the calculations.

(A) Specific Appliances or Loads.

An outlet for a specific appliance or other load not covered in 220.14(B) through (~~J~~ K) shall be calculated based on the ampere rating of the appliance or load served.

(B) Electric Dryers and Electric Cooking Appliances in Dwellings and Household Cooking Appliances Used in Instructional Programs.

Load calculations shall be permitted as specified in 220.54 for electric dryers and in 220.55 for electric ranges and other cooking appliances.

(C) Motor Outlets.

The conductor sizing requirements specified in 430.22, 430.24, and 440.6 shall be used to determine the loads for motor outlets.

(D) Luminaires.

An outlet supplying a luminaire(s) shall be calculated based on the maximum volt-ampere rating of the equipment and lamps for which the luminaire(s) is rated.

(E) Heavy-Duty Lampholders.

Outlets for heavy-duty lampholders shall be calculated at a minimum of 600 volt-amperes.

(F) Sign and Outline Lighting.

Sign and outline lighting outlets shall be calculated at a minimum of 1200 volt-amperes for each required branch circuit specified in 600.5(A).

(G) Show Windows.

Show windows shall be calculated in accordance with either of the following:

(1) The unit load per outlet as required in other provisions of this section

(2) At 200 volt-amperes per linear 300 mm (1 ft) of show window

(H) Fixed Multioutlet Assemblies.

Fixed multioutlet assemblies used in other than dwelling units or the guest rooms or guest suites of hotels or motels shall be calculated in accordance with the following:

(1) Where appliances are unlikely to be used simultaneously, each 1.5 m (5 ft) or fraction thereof of each separate and continuous length shall be considered as one outlet of not less than 180 volt-amperes.

(2) Where appliances are likely to be used simultaneously, each 300 mm (1 ft) or fraction thereof shall be considered as an outlet of not less than 180 volt-amperes.

For the purposes of this section, the calculation shall be permitted to be based on the portion that contains receptacles.

(I) Receptacle Outlets.

Except as covered in 220.41 and ~~(K)~~ 220.14(J) , receptacle outlets shall be calculated at not less than 180 volt-amperes for each single or for each multiple receptacle on one yoke. A single piece of equipment consisting of a multiple receptacle comprised of four or more receptacles shall be calculated at not less than 90 volt-amperes per receptacle. This provision shall not be applicable to the receptacle outlets specified in 210.11(C)(1) and (C)(2).

(J)_ Receptacle Outlets in Office Buildings.

In office buildings, the receptacle loads shall be calculated to be the larger of the following:

(1) The calculated load from 220.14(I)

(2) 11 volt-amperes/m^2 (1 volt-ampere/ft^2)

(K) Other Outlets.

Other outlets not covered in 220.14(A) through (~~K~~ J) shall be calculated based on 180 volt-amperes per outlet.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Thu Oct 21 10:20:27 EDT 2021

Committee Statement

Committee Statement: The Panel reviewed 220.14(I) Receptacle Outlets and revised it to include a reference to the loads to be determined in 220.14(J) for office buildings, which is restored to 220.14 without demand factors, as those only apply when calculating feeder and service loads. The panel also reviewed 220.14(K) Other Outlets and revised it as appropriate to recognize the correct list in the current revision of (A) through (J) in 220.14.

Response Message: SR-8111-NFPA 70-2021

Public Comment No. 887-NFPA 70-2021 [Section No. 220.14(I)]

Second Revision No. 8096-NFPA 70-2021 [Section No. 220.40]

220.40 General.

The calculated load of a feeder or service shall not be less than the sum of the loads on the branch circuits supplied, as determined by Part II of this article, after any applicable demand factors permitted by Part III or Part IV or required by Part V have been applied.

Informational Note: See Informative Annex D, Examples D1(a) through D10 ~~in Informative Annex D~~ , for examples of feeder and service load calculations . See ~~220.18(B)~~ 220.11(B) for the maximum load in amperes permitted for lighting units operating at less than 100 percent power factor.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 16:30:38 EDT 2021

Committee Statement

Committee Statement: The informational note is restructured to comply with 4.1.3 of the NEC Style Manual. The reference to 220.18(B), which was relocated to 220.10(B)(2) in the first draft, is corrected.

***

NOTE: 220.10(B)(2) will be renumbered as 220.11(B) by SR-8111.

Response Message: SR-8096-NFPA 70-2021

Public Comment No. 890-NFPA 70-2021 [Section No. 220.40]

Second Revision No. 8097-NFPA 70-2021 [Section No. 220.48]

220.48 Receptacle Loads — Health Care Facilities .

Receptacle loads calculated in accordance with 220.14(H) and (I) and supplied by branch circuits not exceeding 150 volts to ground shall be permitted to be subjected to the demand factors provided in Table 220.48(1) and Table 220.48(2) for health care facilities covered in Article 517.

Informational Note No. 1: See Article 100 for the definitions of patient care space categories.

Informational Note No. 2: See 220.14(I) for the calculation of receptacle outlet loads.

Table 220.48(1) Demand Factors for ~~Health Care Receptacle Loads~~ Receptacles Supplied by General-Purpose Branch Circuits in Category 1 and Category 2 Patient Care Spaces

Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	Demand Factor (%)
First ~~7500~~ 5000 or less	~~125~~ 100
From ~~7501~~ 5001 to 10,000	~~100~~ 50
~~From 10,001 to 15,000~~	~~50~~
Remainder over ~~15,000~~ 10,000	~~45~~ 25

Table 220.48(2) Demand Factors for Receptacles Supplied by General-Purpose Branch Circuits in Category 3 and Category 4 Patient Care Spaces

Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	Demand Factor (%)
First 10,000 or less	100
Remainder over 10,000	50

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8097_220.48.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 16:47:42 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee (SCR-39 in the 2020 Code cycle) and the Standards Council (Decision D#19-25) have established that CMP-2 has responsibility for occupancy-based load calculations and demand factors. The Task Group formed with members of CMP 2 and CMP 15 reviewed data generated as part of an NFPA Research Foundation project. This project focused on the large number of receptacles required in Category 1 and Category 2 patient care spaces. Based on this information, and with the existing Article 220 Demand Factors for non-dwelling receptacle loads serving as a baseline, new Tables with demand factor values for Receptacles used in Health Care Facilities were

developed. Since the focus was on Category 1 and Category 2 patient care spaces, another table, using existing demand factors from Table 220.44 (2020 NEC), is included to address Category 3 and Category 4 patient care spaces.

Response Message: SR-8097-NFPA 70-2021

Public Comment No. 1745-NFPA 70-2021 [Section No. 220.48]

Public Comment No. 1821-NFPA 70-2021 [Section No. 220.48]

Public Comment No. 632-NFPA 70-2021 [New Section after 220.44]

Public Comment No. 560-NFPA 70-2021 [Section No. 220.48]

Second Revision No. 8098-NFPA 70-2021 [Section No. 220.51]

220.51 Fixed Electric Space Heating.

Fixed electric space-heating loads shall be calculated at 100 percent of the total connected load. However, in no case shall a feeder or service load current rating be less than the rating of the largest branch circuit supplied.

Exception: ~~Where~~ If reduced loading of the conductors results from units operating on duty-cycle~~,~~ or intermittently, or from all units not operating at the same time, the authority having jurisdiction ~~might~~ shall be permitted to grant permission for feeder and service conductors to have an ampacity less than 100 percent~~, provided~~ if the conductors have an ampacity for the load so determined.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 17:01:03 EDT 2021

Committee Statement

Committee Statement: The term “might” is replaced with “shall be permitted to” to bring the exception into compliance with the 3.1.2 of the NEC Style Manual. In addition, the term “where” is replaced with the term "if", as required by 3.3.4 of the NEC Style Manual to indicate a conditional statement.

Response Message: SR-8098-NFPA 70-2021

Public Comment No. 264-NFPA 70-2021 [Section No. 220.51]

Second Revision No. 8099-NFPA 70-2021 [Section No. 220.55]

220.55 Electric Cooking Appliances in Dwelling Units and Household Cooking Appliances Used in Instructional Programs.

The load for household electric ranges, wall-mounted ovens, counter-mounted cooking units, and other household cooking appliances individually rated in excess of 1¾ kW shall be permitted to be calculated in accordance with Table 220.55. Kilovolt-amperes (kVA) shall be considered equivalent to kilowatts (kW) for loads calculated under this section.

Where two or more single-phase ranges are supplied by a 3-phase, 4-wire feeder or service, the total load shall be calculated on the basis of twice the maximum number connected between any two phases.

Table 220.55 Demand Factors and Loads for Household Electric Ranges, Wall-Mounted Ovens, Counter-Mounted Cooking Units, and Other Household Cooking Appliances over 1¾ kW Rating (Column C to be used in all cases except as otherwise permitted in Note 3.)

Number of Appliances	Demand Factor (%) (See Notes)		Column C Maximum Demand (kW) (See Notes) (Not over 12 kW Rating)
	Column A (Less than 3½ kW Rating)	Column B (3½ kW through 8¾ kW Rating)	
1	80	80	8
2	75	65	11
3	70	55	14
4	66	50	17
5	62	45	20
6	59	43	21
7	56	40	22
8	53	36	23
9	51	35	24
10	49	34	25
11	47	32	26
12	45	32	27
13	43	32	28
14	41	32	29
15	40	32	30
16	39	28	31
17	38	28	32
18	37	28	33
19	36	28	34
20	35	28	35
21	34	26	36
22	33	26	37
23	32	26	38
24	31	26	39
25	30	26	40
26–30	30	24	15 kW + 1 kW for each range
31–40	30	22	

Number of Appliances	Demand Factor (%) (See Notes)		Column C Maximum Demand (kW) (See Notes) (Not over 12 kW Rating)
	Column A (Less than 3½ kW Rating)	Column B (3½ kW through 8¾ kW Rating)	
41–50	30	20	25 kW + ¾ kW for each range
51–60	30	18	
61 and over	30	16	

Notes:

1. *Over 12 kW through 27 kW ranges all of same rating.* For ranges individually rated more than 12 kW but not more than 27 kW, the maximum demand in Column C shall be increased 5 percent for each additional kilowatt of rating or major fraction thereof by which the rating of individual ranges exceeds 12 kW.

2. *Over 8¾ kW through 27 kW ranges of unequal ratings.* For ranges individually rated more than 8¾ kW and of different ratings, but none exceeding 27 kW, an average value of rating shall be calculated by adding together the ratings of all ranges to obtain the total connected load (using 12 kW for any range rated less than 12 kW) and dividing by the total number of ranges. Then the maximum demand in Column C shall be increased 5 percent for each kilowatt or major fraction thereof by which this average value exceeds 12 kW.

3. *Over 1¾ kW through 8¾ kW.* In lieu of the method provided in Column C, adding the nameplate ratings of all household cooking appliances rated more than 1¾ kW but not more than 8¾ kW and multiplying the sum by the demand factors specified in Column A or Column B for the given number of appliances shall be permitted. Where the rating of cooking appliances falls under both Column A and Column B, the demand factors for each column shall be applied to the appliances for that column, and the results added together.

4. Calculating the branch-circuit load for one range in accordance with Table 220.55 shall be permitted.

5. The branch-circuit load for one wall-mounted oven or one counter-mounted cooking unit shall be the nameplate rating of the appliance.

6. The branch-circuit load for a counter-mounted cooking unit and not more than two wall-mounted ovens, all supplied from a single branch circuit and located in the same room, shall be calculated by adding the nameplate rating of the individual appliances and treating this total as equivalent to one range.

7. This table shall also apply to household cooking appliances rated over 1¾ kW and used in instructional programs.

Informational Note No. 1: See ~~the examples in~~ Informative Annex D for examples .

Informational Note No. 2: See Table 220.56 for demand factors for commercial cooking equipment.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 17:05:15 EDT 2021

Committee Statement

Committee Statement: Informational Note No. 1 is restructured to comply with 4.1.3 of the NEC Style Manual.

Response Message: SR-8099-NFPA 70-2021

Public Comment No. 904-NFPA 70-2021 [Section No. 220.55]

Second Revision No. 8100-NFPA 70-2021 [New Section after 220.57]

220.58 Marinas, Boatyards, Floating Buildings, and Commercial and Noncommercial Docking Facilities.

General lighting and other loads in marinas, boatyards, floating buildings, and commercial and noncommercial docking facilities shall be calculated in accordance with Part III of this article and, in addition, the demand factors set forth in Table 220.58 shall be permitted for each service 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) of Table 220.58 . Where demand factors of Table 220.58 are applied, the demand factor specified in 220.61(B) shall not be permitted.

Informational Note: These demand factors might be inadequate in areas of extreme hot or cold temperatures with loaded circuits for heating, air-conditioning, or refrigerating equipment.

Table 220.58 Demand Factors for Marinas, Boatyards, Floating Buildings, and Commercial and Noncommercial Docking Facilities

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 220.58, 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.

Submitter Information Verification

Committee: NEC-P02
Submittal Date: Wed Oct 20 17:08:51 EDT 2021

Committee Statement

Committee It has been established by the Correlating Committee (PC 632) and the Standards

Statement: Council (D#19-25) that load calculations are the purview of CMP 2. Section 555.6 is being relocated to 220.58. This revision does not change the requirements for load calculations for marinas but relocates the requirements to Article 220.

Response Message: SR-8100-NFPA 70-2021

Public Comment No. 1672-NFPA 70-2021 [New Section after 220.57]

Second Revision No. 8101-NFPA 70-2021 [Section No. 220.57]

220.57 Electric Vehicle Supply Equipment (EVSE) Load.

The EVSE load shall be calculated at either 7200 watts (volt-amperes) or the nameplate rating of the equipment, whichever is larger.

~~Informational Note: See 625.42 for sizing of an EVSE circuit.~~

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 17:17:17 EDT 2021

Committee Statement

Committee Statement: The nameplate on the unit already takes into account the 125% of the actual load, and therefore 7200 VA is the minimum value to be used in this calculation. When using the nameplate rating of the EVSE in this calculation, the continuous load is taken into account. The informational note is eliminated to avoid confusion.

Response Message: SR-8101-NFPA 70-2021

Public Comment No. 429-NFPA 70-2021 [Section No. 220.57]

Public Comment No. 1342-NFPA 70-2021 [Section No. 220.57]

Second Revision No. 8102-NFPA 70-2021 [Section No. 220.60]

220.60 Noncoincident Loads.

~~Where~~ If it is unlikely that two or more noncoincident loads will be in use simultaneously, using only the largest load(s) that will be used at one time for calculating the total load of a feeder or service shall be permitted. Where a motor or air-conditioning load is part of the noncoincident load and is not the largest of the noncoincident loads, 125 percent of either the motor load or air-conditioning load, whichever is larger, shall be used in the calculation.

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 17:20:31 EDT 2021

Committee Statement

Committee Statement: "If" is required to be used to indicate a conditional statement while "where" is used to indicate a location. See 3.3.4 of the NEC Style Manual. In the context of 220.60, the correct term is “if”.

Additional proposed changes do not add clarity and would create confusion with multiple uses of the term “noncoincident”. This section is also used for other types of noncoincident loads, not just for motors and air conditioning, and in some cases, for more than one set of loads.

Response Message: SR-8102-NFPA 70-2021

Public Comment No. 266-NFPA 70-2021 [Section No. 220.60]

Second Revision No. 8103-NFPA 70-2021 [Section No. 220.61(B)]

(B) Permitted Reductions.

A service or feeder supplying the following loads shall be permitted to have an additional demand factor of 70 percent applied to the amount in 220.61(B)(1) and a portion of the amount in 220.61(B)(2) ~~determined by the following basic calculations~~ .

(1) Household Electric Ranges, Wall-Mounted Ovens, Counter-Mounted Cooking Units, and Dryers.

A feeder or service supplying household electric ranges, wall-mounted ovens, counter-mounted cooking units, and electric dryers, where the maximum unbalanced load has been determined in accordance with Table 220.55 for ranges and Table 220.54 for dryers.

(2) Unbalanced Load in Excess of 200 Amperes.

That portion of the unbalanced load in excess of 200 amperes where the feeder or service is supplied from a 3-wire dc or single-phase ac system; a 4-wire, 3-phase system; a 3-wire, 2-phase system; or a 5-wire, 2-phase system.

Informational Note: See Informative Annex D, Examples D1(a), D1(b), D2(b), D4(a), and D5(a) ~~in Informative Annex D~~ for examples of unbalanced feeder or service neutral loads .

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 17:25:56 EDT 2021

Committee Statement

Committee Statement: The informational note in 220.61(B)(2) is restructured to comply with 4.1.3 of the NEC Style Manual.

Response Message: SR-8103-NFPA 70-2021

Public Comment No. 905-NFPA 70-2021 [Section No. 220.61(B)]

Second Revision No. 8106-NFPA 70-2021 [Section No. 220.70]

220.70 Energy Management Systems (EMSs).

If an energy management system (EMS) is used to limit the current to a feeder or service in accordance with 750.30 , a single value equal to the maximum ampere setpoint of the EMS shall be permitted to be used in load calculations for the feeder or service. ~~where designated loads are controlled by the EMS and all of the following conditions are met:~~

(0) ~~Only listed EMS shall be permitted use of the load calculation allowance of this section.~~

(0) ~~Upon system malfunction, the EMS shall use monitoring and controls to disconnect the loads associated with the current limiting feature.~~

(0) ~~Access to the settings of the EMS shall be restricted to qualified personnel in accordance with the requirements of 240.6(C).~~

(0) ~~The equipment that supplies the feeder or service shall be field marked with the following information:~~

0. ~~Maximum current setting~~
0. ~~Date of calculation and setting~~
0. ~~Identification of loads associated with the current limiting feature~~
0. ~~The following or equivalent wording: "The setting for the EMS current limiting feature shall not be bypassed"~~

~~The markings shall meet the requirements in 110.21(B) and shall be located such that they are clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.~~

The setpoint value of the EMS shall be considered a continuous load for the purposes of load calculations. ~~In addition, loads not controlled by the EMS, but connected to the same feeder or service, shall be included in load calculations for that feeder or service as approved by other sections.~~

Supplemental Information

File Name	Description	Approved
NEC_CMP02_SR8106_220.70.docx	staff use	

Submitter Information Verification

Committee: NEC-P02

Submittal Date: Wed Oct 20 18:03:37 EDT 2021

Committee Statement

Committee Statement: Requirements that relate to the installation of the energy management system were removed, as the requirements for installing these products are located in Article 750. A reference to those requirements is provided. Only requirements for load calculations of energy management systems remain in this section. This approach is based on PC 1039, which was created by a balanced Task Group, formed as a result of a Correlating Committee Note.

Changes suggested for improved wording and replacement of the term “approved” are unnecessary, as the text the submitter of PC 1345 was requesting to be changed has been removed from this Section.

Response Message: SR-8106-NFPA 70-2021

Public Comment No. 1039-NFPA 70-2021 [Section No. 220.70]

Public Comment No. 1345-NFPA 70-2021 [Section No. 220.70]