



Second Revision No. 8529-NFPA 70-2021 [Detail]

Change title of Article 530 to read: Motion Picture and Television Studios and Remote Locations

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:09:41 EDT 2021

Committee Statement

Committee Statement: The title of Article 530 is revised by replacing the vague term “similar locations” with the newly defined term “remote locations,.” to be in compliance with Section 3.2.1 of the NEC Style Manual.

Response Message: SR-8529-NFPA 70-2021

[Public Comment No. 2225-NFPA 70-2021 \[Part I.\]](#)



Second Revision No. 8644-NFPA 70-2021 [Detail]

Move Informational Note below from 518.2 (C) to 518.1 Scope

Informational Note: See the local building code or, in its absence, NFPA 101-2021, *Life Safety Code*, for methods of determining population capacity.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 12:48:45 EDT 2021

Committee Statement

Committee Statement: The CMP identified that the informational note for determining population capacity is applicable to all of Article 518 and relocated to the 518.1

Response Message: SR-8644-NFPA 70-2021



Second Revision No. 8666-NFPA 70-2021 [Detail]

517.30

(1) Utility Supply Power.

Where utility power is used as the normal source, utility power shall not ~~be permitted to~~ be used as the alternate source unless permitted elsewhere in this article.

Informational Note: See 517.35 and 517.45 for essential system loads that can be supplied from dual sources of utility supply power.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP15_SR8666_517.30_1.docx	For staff use	

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 15:48:51 EDT 2021

Committee Statement

Committee Statement: Note from the CC to remove that phrase.

Response Message: SR-8666-NFPA 70-2021



Second Revision No. 8609-NFPA 70-2021 [Definition: Alternating-Current Power Distribution Box (Alt...)

~~Alternating-Current Power Distribution Box (Alternating-Current Plugging Box) (Scatter Box).~~

~~An ac distribution center or box that contains one or more grounding-type polarized receptacles that can contain overcurrent protective devices. (530) (CMP-15)~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 20:26:09 EDT 2021

Committee Statement

Committee Statement: This change is being submitted from the CMP-15 Definitions Task Group.

This deletion was missed in the re-write of Article 530 and transfer of definitions to Article 100. This definition is no longer used in Article 530.

Response Message: SR-8609-NFPA 70-2021

[Public Comment No. 518-NFPA 70-2021 \[Definition: Alternating-Current Power Distribution Box \(Alt...\)\]](#)



Second Revision No. 8557-NFPA 70-2021 [Definition: Exposed Conductive Surfaces.]

Exposed Conductive Surfaces (as applied to health care facilities) .

Those surfaces that are capable of carrying electric current and that are unprotected, uninsulated, unenclosed, or unguarded, permitting personal contact. [99:3.3.54] (517) (CMP-15)

Informational Note: Paint, anodizing, and similar coatings are not considered suitable insulation, unless they are listed for such use.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 13:29:24 EDT 2021

Committee Statement

Committee Statement: The term and associated definition "Exposed Conductive Surfaces" in Article 517 is an extract from NFPA 99, Health Care Facilities, and essential for correlation between the two Codes. As such, the Article 100 definition is revised in the Second Revision to Correlating Committee Note 364 401 (Global Input) and PC 1027 (public comment) to "Exposed Conductive Surfaces (as applied to health care facilities)".

CMP-15 reviewed Article 517 for the usage of the term "exposed". CMP-15 revised the Informational Note of 517.4 from "... by insulating exposed surfaces ..." to "... by insulating exposed conductive surfaces ...".

CMP-15 did not revise the phrase "... exposed current-carrying elements ..." of 517.64(A) because surfaces that are current-carrying (normally energized) are not merely conductive (likely to become energized). In this instance, the more general definition for "Exposed (as applied to live parts)" would apply. Further, this requirement is not an extraction from NFPA 99.

Response Message: SR-8557-NFPA 70-2021



Second Revision No. 8549-NFPA 70-2021 [Definition: Fault Hazard Current

(as applied to hazard curr...]

Hazard Current, Fault. (Fault Hazard Current ~~(as applied to hazard current).~~)

The hazard current of a given isolated power system with all devices connected except the line isolation monitor. [99:3.3.72.1] (517) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:55:01 EDT 2021

Committee Statement

Committee Statement: Change coordinates the consolidation of the definitions in Article 100. Corrects the searchable term per MOS 2.2.2.3.1. and corrects the term to comply with 2.2.2.3

Response Message: SR-8549-NFPA 70-2021

[Public Comment No. 489-NFPA 70-2021 \[Definition: Fault Hazard Current \(as applied to hazard curr...\]](#)

[Public Comment No. 491-NFPA 70-2021 \[Definition: Monitor Hazard Current \(as applied to hazard cu...\]](#)

[Public Comment No. 492-NFPA 70-2021 \[Definition: Total Hazard Current \(as applied to hazard curr...\]](#)



Second Revision No. 8610-NFPA 70-2021 [Definition: Fault Hazard Current.]

Fault Hazard Current.

~~See Hazard Current .~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 20:40:10 EDT 2021

Committee Statement

Committee Statement: This change is being submitted from the CMP-15 Definitions Task Group.

This definition is redundant and addressed under the base term of Hazard Current.

Response Message: SR-8610-NFPA 70-2021

[Public Comment No. 376-NFPA 70-2021 \[Definition: Fault Hazard Current.\]](#)



Second Revision No. 8552-NFPA 70-2021 [Definition: Health Care Microgrid.]

Microgrid Systems, Health Care. (Health Care Microgrid.)

A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the utility. [99:3.3.75] (517) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 13:01:02 EDT 2021

Committee Statement

Committee Statement: Corrects the base term to be Microgrid "Systems"

Response Message: SR-8552-NFPA 70-2021

Public Comment No. 493-NFPA 70-2021 [Definition: Health Care Microgrid.]



Second Revision No. 8534-NFPA 70-2021 [Definition: Location (Shooting Location).]

~~Location (Shooting Location).~~

~~A place outside a motion picture studio where a production or part of a production is filmed or recorded. (530) (CMP-15)~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:15:06 EDT 2021

Committee Statement

Committee Statement: This deletion was missed in the re-write of article 530 and transfer of definitions to article 100. This definition is no longer used in Article 530.

Response Message: SR-8534-NFPA 70-2021

[Public Comment No. 506-NFPA 70-2021 \[Definition: Location \(Shooting Location\).\]](#)



Second Revision No. 8535-NFPA 70-2021 [Definition: Location Board (Deuce Board).]

~~Location Board (Deuce Board).~~

~~Portable equipment containing a lighting contactor(s) and overcurrent protection designed for remote control of stage lighting. (530) (CMP-15)~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:16:07 EDT 2021

Committee Statement

Committee Statement: This deletion was missed in the re-write of Article 530 and transfer of definitions to Article 100. This definition is no longer used in Article 530

Response Message: SR-8535-NFPA 70-2021

[Public Comment No. 507-NFPA 70-2021 \[Definition: Location Board \(Deuce Board\).\]](#)



Second Revision No. 8536-NFPA 70-2021 [Definition: Motion Picture Studio (Lot).]

~~Motion Picture Studio (Lot).~~

~~A building or group of buildings and other structures designed, constructed, or permanently altered for use by the entertainment industry for the purpose of motion picture or television production. (CMP-15)~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:17:05 EDT 2021

Committee Statement

Committee Statement: This deletion was missed in the re-write of Article 530 and transfer of definitions to Article 100. This definition is no longer used in Article 530

Response Message: SR-8536-NFPA 70-2021

[Public Comment No. 494-NFPA 70-2021 \[Definition: Motion Picture Studio \(Lot\).\]](#)



Second Revision No. 8546-NFPA 70-2021 [Definition: Nonprofessional Projector.]

Projector, Nonprofessional. (Nonprofessional Projector.)

Those types of projectors that do not comply with the definition of *Professional-Type Projector*. (540) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:44:05 EDT 2021

Committee Statement

Committee Statement: The title of the definition was revised for searchability and to provide for grouping under the general term “projector.”

Response Message: SR-8546-NFPA 70-2021

[Public Comment No. 495-NFPA 70-2021 \[Definition: Nonprofessional Projector.\]](#)



Second Revision No. 8665-NFPA 70-2021 [Definition: Patient Care Space.]

Patient Care Space Category .

Any space of a health care facility wherein patients are intended to be examined or treated. [99:3.3.140] (517) (CMP-15)

Informational Note No. 1: The health care facility's governing body designates patient care space in accordance with the type of patient care anticipated.

Informational Note No. 2: Business offices, corridors, lounges, day rooms, dining rooms, or similar areas typically are not classified as patient care spaces. [99:A.3.3.140]

Category 1 Space (~~as applied to patient care space~~ Category 1).

Space in which failure of equipment or a system is likely to cause major injury or death of patients, staff, or visitors. [99:3.3.140.1] (CMP-15)

Informational Note: These spaces, formerly known as critical care rooms, are typically where patients are intended to be subjected to invasive procedures and connected to line-operated, patient care-related appliances. Examples include, but are not limited to, special care patient rooms used for critical care, intensive care, and special care treatment rooms such as angiography laboratories, cardiac catheterization laboratories, delivery rooms, operating rooms, post-anesthesia care units, trauma rooms, and other similar rooms. [99:A.3.3.140.1]

Category 2 Space (~~as applied to patient care space~~ Category 2).

Space in which failure of equipment or a system is likely to cause minor injury to patients, staff, or visitors. [99:3.3.140.2] (CMP-15)

Informational Note: These spaces were formerly known as general care rooms. Examples include, but are not limited to, inpatient bedrooms, dialysis rooms, in vitro fertilization rooms, procedural rooms, and similar rooms. [99:A.3.3.140.2]

Category 3 Space (~~as applied to patient care space~~ Category 3).

Space in which the failure of equipment or a system is not likely to cause injury to patients, staff, or visitors but can cause discomfort. [99:3.3.140.3] (517) (CMP-15)

Informational Note: These spaces, formerly known as basic care rooms, are typically where basic medical or dental care, treatment, or examinations are performed. Examples include, but are not limited to, examination or treatment rooms in clinics, medical and dental offices, nursing homes, and limited care facilities. [99:A.3.3.140.3]

Category 4 Space (~~as applied to patient care space~~ Category 4).

Space in which failure of equipment or a system is not likely to have a physical impact on patient care. [99:3.3.140.4] (517) (CMP-15)

Informational Note: These spaces were formerly known as support rooms. Examples of support spaces include, but are not limited to, anesthesia work rooms, sterile supply, laboratories, morgues, waiting rooms, utility rooms, and lounges. [99:A.3.3.140.4]

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 15:25:23 EDT 2021

Committee Statement

Committee Statement: Corrects the searchable term per MOS 2.2.2.3.1 and corrects the term to comply with 2.2.2.3 as a grouped term under the listing of "Patient Care Space Category".

Response Message: SR-8665-NFPA 70-2021

[Public Comment No. 499-NFPA 70-2021 \[Definition: Category 3 Space \(as applied to patient care sp...\)\]](#)

[Public Comment No. 497-NFPA 70-2021 \[Definition: Category 1 Space \(as applied to patient care sp...\)\]](#)

[Public Comment No. 500-NFPA 70-2021 \[Definition: Category 4 Space \(as applied to patient care sp...\)\]](#)

[Public Comment No. 498-NFPA 70-2021 \[Definition: Category 2 Space \(as applied to patient care sp...\)\]](#)



Second Revision No. 8538-NFPA 70-2021 [Definition: Plugging Box.]

Plugging Box.

~~A dc device consisting of one or more 2-pole, 2-wire, nonpolarized, nongrounding-type receptacles intended to be used on dc circuits only. (530) (CMP-15)~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:17:52 EDT 2021

Committee Statement

Committee Statement: This deletion was missed in the re-write of Article 530 and transfer of definitions to Article 100. This definition is no longer used in Article 530

Response Message: SR-8538-NFPA 70-2021

[Public Comment No. 519-NFPA 70-2021 \[Definition: Plugging Box.\]](#)



Second Revision No. 8548-NFPA 70-2021 [Definition: Professional-Type Projector.]

Projector, Professional-Type. (Professional-Type Projector.)

A type of projector using 35- or 70-mm film that has a minimum width of 35 mm (1 $\frac{3}{8}$ in.) and has on each edge 212 perforations per meter (5.4 perforations per inch), or a type using carbon arc, xenon, or other light source equipment that develops hazardous gases, dust, or radiation. (540) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:47:57 EDT 2021

Committee Statement

Committee Statement: The title of the definition was revised for searchability and to provide for grouping under the general term "projector."

Response Message: SR-8548-NFPA 70-2021

[Public Comment No. 496-NFPA 70-2021 \[Definition: Professional-Type Projector.\]](#)



Second Revision No. 8542-NFPA 70-2021 [Definition: Stand Lamp (Work Light).]

Stand Lamp (Work Light).

A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination on ~~the~~ a stage, in an auditorium, or in ~~the~~ auditorium a studio . (520–530) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:27:58 EDT 2021

Committee Statement

Committee Statement: The definition was revised by adding a reference to “studios” so a single definition can be used with both Article 520 and 530.

Response Message: SR-8542-NFPA 70-2021

[Public Comment No. 503-NFPA 70-2021 \[Definition: Stand Lamp \(Work Light\).\]](#)



Second Revision No. 8539-NFPA 70-2021 [Definition: Television Studio or Motion Picture Stage (Soun...]

~~Television Studio or Motion Picture Stage (Sound Stage).~~

~~A building or portion of a building usually insulated from the outside noise and natural light for use by the entertainment industry for the purpose of motion picture, television, or commercial production. (530) (CMP-15)~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:18:43 EDT 2021

Committee Statement

Committee Statement: This deletion was missed in the re-write of Article 530 and transfer of definitions to Article 100. This definition is no longer used in Article 530

Response Message: SR-8539-NFPA 70-2021

[Public Comment No. 505-NFPA 70-2021 \[Definition: Television Studio or Motion Picture Stage \(Soun...\]](#)



Second Revision No. 8699-NFPA 70-2021 [Definitions (100): Stage Switc... to Stage Switc...]

Stage Switchboard, Fixed. (Fixed Stage Switchboard)

A permanently installed switchboard, panelboard, or rack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone, used primarily to feed stage equipment. (CMP-15)

Stage Switchboard, Portable. (Portable Stage Switchboard)

A portable rack or pack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone, used to feed stage equipment. (520) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Mon Nov 01 11:14:54 EDT 2021

Committee Statement

Committee Statement: The title of the definitions was revised for searchability and so they will be alphabetically in order. The definitions were not combined as portable stage switchboards only supply stage equipment whereas fixed stage switchboards supply stage and other equipment. Additionally, they need to remain as separate definitions as the requirements for them are located in two different parts of Article 520.

Response Message: SR-8699-NFPA 70-2021

[Public Comment No. 521-NFPA 70-2021 \[Definition: Stage Switchboard.\]](#)



Second Revision No. 8543-NFPA 70-2021 [New Definition after Definition: DC-to-DC Converter Circuit.]

DC Plugging Box.

A dc device consisting of one or more 2-pole, 2-wire, nonpolarized, non-grounding-type receptacles intended to be used on dc circuits only. (530) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:29:04 EDT 2021

Committee Statement

Committee Statement: The definition is being added to Article 100 as it was intended during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked.

Response Message: SR-8543-NFPA 70-2021

Public Comment No. 508-NFPA 70-2021 [New Definition after Definition: DC-to-DC Converter Circuit.]



Second Revision No. 8637-NFPA 70-2021 [New Definition after Definition: Motor Control Center.]

Motion Picture and/or Television Studio.

A building, group of buildings, other structures, and outdoor areas designed, constructed, permanently altered, designated, or approved for the purpose of motion picture or television production. (530) (CMP-15).

Motion Picture and/or Television Studio Sound Stage.

A building or portion of a building, usually insulated from outside noise and natural light, designed, constructed, or altered for the purpose of image capture. (530) (CMP-15).

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 12:23:15 EDT 2021

Committee Statement

Committee Statement: The definitions are being added to Article 100 as it was intended during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked.

Response Message: SR-8637-NFPA 70-2021

Public Comment No. 509-NFPA 70-2021 [New Definition after Definition: Motion Picture Studio (Lot...]



Second Revision No. 8612-NFPA 70-2021 [New Definition after Definition: Portable Structures.]

Portable Substation.

A portable assembly, usually mounted on a trailer, containing primary and secondary switchgear and a transformer. (530) (CMP-15).

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 20:46:23 EDT 2021

Committee Statement

Committee Statement: This change is being submitted from the CMP-15 Definitions Task Group.

The definition is being added to Article 100 as it was intended during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked.

Response Message: SR-8612-NFPA 70-2021

Public Comment No. 510-NFPA 70-2021 [New Definition after Definition: Portable Structures.]



Second Revision No. 8629-NFPA 70-2021 [New Definition after Definition: Prime Mover.]

Production Areas.

Areas where portable electrical equipment covered by Article 530 is used to implement the capture of images. (530) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 11:53:52 EDT 2021

Committee Statement

Committee Statement: The definition is being added to Article 100 as it was intended during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked.

Response Message: SR-8629-NFPA 70-2021

Public Comment No. 511-NFPA 70-2021 [New Definition after Definition: Process Seal.]



Second Revision No. 8634-NFPA 70-2021 [New Definition after Definition: PV DC Circuit, Source. (PV...]

Purpose-Built.

A custom luminaire, a piece of lighting equipment, or an effect that is constructed for a specific purpose and is not serially manufactured or available for general sale. (530) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 12:16:42 EDT 2021

Committee Statement

Committee Statement: The definition is being added to Article 100 as it was added during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked.

Response Message: SR-8634-NFPA 70-2021

[Public Comment No. 512-NFPA 70-2021 \[New Definition after Definition: Purged and Pressurized.\]](#)



Second Revision No. 8627-NFPA 70-2021 [New Definition after Definition: Remote Disconnect Control.]

Remote Location.

A location, other than a motion picture or television studio, where a production is filmed or recorded. (530) (CMP-15).

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 11:45:19 EDT 2021

Committee Statement

Committee Statement: The definition is being added to Article 100 as it was intended during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked

Response Message: SR-8627-NFPA 70-2021

Public Comment No. 513-NFPA 70-2021 [New Definition after Definition: Remote Disconnect Control.]



Second Revision No. 8632-NFPA 70-2021 [New Definition after Definition: Surge Arrester.]

Support Areas.

Areas, other than fixed production offices, intended to support production and where image capture will not take place. Such areas include, but are not limited to, mobile production offices, storage, and workspaces; vehicles and trailers for cast, makeup, hair, lighting, grip, wardrobe, props, catering, and craft services; and portable restrooms. (530) (CMP-15)

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 12:04:18 EDT 2021

Committee Statement

Committee Statement: The definition is being added to Article 100 as it was intended during the First Draft rewrite of Article 530 and relocation of the definitions to Article 100 but was overlooked

Response Message: SR-8632-NFPA 70-2021

Public Comment No. 517-NFPA 70-2021 [New Definition after Definition: Supervisory Control and Da...]



Second Revision No. 8694-NFPA 70-2021 [Sections 517.1, 517.4]

517.1 Scope.

This article applies to electrical construction and installation criteria in health care facilities that provide services to human beings.

The requirements of this article shall specify the installation criteria and wiring methods that minimize electrical hazards by the maintenance of adequately low potential differences only between exposed conductive surfaces that are likely to become energized and could be contacted by a patient.

Informational Note No. 1: In a health care facility, it is difficult to prevent the occurrence of a conductive or capacitive path from the patient's body to some grounded object, because that path might be established accidentally or through instrumentation directly connected to the patient. Other electrically conductive surfaces that might make an additional contact with the patient, or instruments that might be connected to the patient, then become possible sources of electric currents that can traverse the patient's body. The hazard is increased as more apparatus is associated with the patient, therefore more intensive precautions are needed. Control of electric shock hazard requires the limitation of electric current that might flow in an electrical circuit involving the patient's body by raising the resistance of the conductive circuit that includes the patient, or by insulating exposed conductive surfaces that might become energized, in addition to reducing the potential difference that can appear between exposed conductive surfaces in the patient care vicinity, or by combinations of these methods. A special problem is presented by the patient with an externalized direct conductive path to the heart muscle. The patient could be electrocuted at current levels so low that additional protection in the design of appliances, insulation of the catheter, and control of medical practice is required.

The requirements in Parts II and III not only apply to single-function buildings but are also intended to be individually applied to their respective forms of occupancy within a multifunction building ([e.g., a doctor's examining room located within a limited care facility would be required to meet ~~517.10~~ 517.10(A)]).

Informational Note No. 2 : For information concerning performance, maintenance, and testing criteria, refer to the appropriate health care facilities documents.

Informational Note No. 3: Text that is followed by a reference in brackets has been extracted from NFPA 99-2021, *Health Care Facilities Code*, or NFPA 101-2021, *Life Safety Code*. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

517.4 General Installation — Construction Criteria.

The requirements of this article shall specify the installation criteria and wiring methods that minimize electrical hazards by the maintenance of adequately low potential differences only between exposed conductive surfaces that are likely to become energized and could be contacted by a patient.

Informational Note: In a health care facility, it is difficult to prevent the occurrence of a conductive or capacitive path from the patient's body to some grounded object, because that path might be established accidentally or through instrumentation directly connected to the patient. Other electrically conductive surfaces that might make an additional contact with the patient, or instruments that might be connected to the patient, then become possible sources of electric currents that can traverse the patient's body. The hazard is increased as more apparatus is associated with the patient, therefore more intensive precautions are needed. Control of electric shock hazard requires the limitation of electric current that might flow in an electrical circuit involving the patient's body by raising the resistance of the conductive circuit that includes the patient, or by insulating exposed surfaces that might become energized, in addition to reducing the potential difference that can appear between exposed conductive surfaces in the patient care vicinity, or by combinations of these methods. A special problem is presented by the patient with an externalized direct conductive path to the heart muscle. The patient could be electrocuted at current levels so low that additional protection in the design of appliances, insulation of the catheter, and control of medical practice is required.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP15_SR8694_517.1.docx	For staff use	

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Mon Nov 01 10:16:30 EDT 2021

Committee Statement

Committee Statement: The scope of Article 517 was revised to incorporate the text and informational note formally found in 517.11 in the 2020 NEC which was relocated to 517.4 for First Draft of the 2023 NEC. The information provided is related to the scope of the article so it should be located in 517.1. The CMP understands the NEC CC has jurisdiction over scope statements, and recommends approval.

Response Message: SR-8694-NFPA 70-2021

Public Comment No. 1413-NFPA 70-2021 [Section No. 517.4]



Second Revision No. 8562-NFPA 70-2021 [Section No. 517.10(B)]

(B) Not Covered.

Part II shall not apply to the following:

- (1) Business offices, corridors, waiting rooms, and the like in clinics, medical and dental offices, and outpatient facilities
- (2) Spaces of nursing homes and limited care facilities wired in accordance with Chapters 1 through 4 of this *Code* where these spaces are used exclusively as patient sleeping rooms, as determined by the health care facility's governing body.

Informational Note No. 1: See 406.12(5) for receptacles located in health care facility business offices, corridors, and waiting rooms that are required to be tamper resistant.

Informational Note No. 2: See 210.12(D) for branch circuits supplying outlets and receptacles located in patient sleeping rooms in nursing homes and limited care facilities that are connected to arc-fault circuit-interrupter circuits.

- (3) Areas used exclusively for any of the following purposes:
 - a. Intramuscular injections (immunizations)
 - b. Psychiatry and psychotherapy
 - c. Alternative medicine
 - d. Optometry
 - e. Pharmacy services not contiguous to health care facilities

Informational Note No. 3: See NFPA 101-2021, *Life Safety Code*.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 14:49:20 EDT 2021

Committee Statement

Committee Statement: See the action by CMP-2. These rooms are used exclusively for patient sleeping and the devices would not be required where patient monitoring, treatment or procedures are being performed.

Response Message: SR-8562-NFPA 70-2021

[Public Comment No. 523-NFPA 70-2021 \[Section No. 517.10\(B\)\]](#)



Second Revision No. 8563-NFPA 70-2021 [Section No. 517.13(B)(1)]

(1) General.

An insulated copper equipment grounding conductor that is clearly identified along its entire length by green insulation and installed with the branch circuit conductors within the wiring method in accordance with 517.13(A) shall be ~~directly~~ connected to the following:

- (1) Grounding terminals of all receptacles other than isolated ground receptacles
- (2) Metal outlet boxes, metal device boxes, or metal enclosures
- (3) Non-current-carrying conductive surfaces of fixed electrical equipment likely to become energized that are subject to personal contact, operating at over 100 volts

Exception No. 1: For other than isolated ground receptacles, an insulated equipment bonding jumper that directly connects to the equipment grounding conductor shall be permitted to connect the box and receptacle(s) to the equipment grounding conductor. Isolated ground receptacles shall be connected in accordance with 517.16.

Exception No. 2: Metal faceplates shall be connected to an effective ground-fault current path by means of a metal mounting screw(s) securing the faceplate to a metal yoke or strap of a receptacle or to a metal outlet box.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 14:55:10 EDT 2021

Committee Statement

Committee Statement: The term "Directly" doesn't add any value to the requirement and has been eliminated.

Response Message: SR-8563-NFPA 70-2021

[Public Comment No. 1414-NFPA 70-2021 \[Section No. 517.13\(B\)\(1\)\]](#)



Second Revision No. 8564-NFPA 70-2021 [Section No. 517.20(A)]

(A) Receptacles and Fixed Equipment.

Wet procedure locations shall be provided with special protection against electric shock.

[99:6.3.2.3.1]

This special protection shall be provided ~~as follows~~ by one of the following :

- (1) Isolated power systems that remain in operation in the event of a single line-to-ground fault condition that inherently limits the possible ground-fault current due to a first fault to a low value, without interrupting the power supply

Informational Note No. 1: Isolated power systems can eliminate the danger of electric shock to patients who might be more susceptible to leakage current and unable to move in their beds.

- (2) Power distribution system in which the power supply is interrupted if the ground-fault current does, in fact, exceed the trip value of a Class A GFCI

Informational Note No. 2: See Annex E of ANSI/UL 943-2018, *Ground-Fault Circuit-Interrupters*, ~~Annex E~~, and, ~~in accordance with 110.3(B)~~, for the manufacturers' installation instructions of listed ground-fault circuit interrupters for information on the supply connection of life-support equipment to circuits providing ground-fault circuit-interrupter (GFCI) protection of personnel at outlets.

[99:6.3.2.3.2]

Exception: Branch circuits supplying only listed, fixed, therapeutic, and diagnostic equipment shall be permitted to be supplied from a grounded service, single- or 3-phase system if the following conditions are met:

- (1) *Wiring for grounded and isolated circuits does not occupy the same raceway.*
- (2) *All conductive surfaces of the equipment are connected to an insulated copper equipment grounding conductor.*

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 14:57:52 EDT 2021

Committee Statement

Committee Statement: Without this change, the section requires BOTH IPS and GFCI.

Removed the requirements in the informational note in accordance with 3.1.3 of the NEC Style Manual.

Response Message: SR-8564-NFPA 70-2021

[Public Comment No. 930-NFPA 70-2021 \[Section No. 517.20\]](#)

[Public Comment No. 1690-NFPA 70-2021 \[Section No. 517.20\]](#)



Second Revision No. 8598-NFPA 70-2021 [Section No. 517.22]

517.22 Demand Factors.

Demand factors for receptacle loads supplied by general-use receptacles and individual branch circuits not exceeding 150 volts to ground and installed in Category 1, Category 2, Category 3, and Category 4 patient care spaces shall be permitted to be applied in accordance with 517.22(A) and (B) 220.48 .

Informational Note: See Article 100 for the definitions of patient care space categories.

(A) General-Use Receptacles.

In addition to demand factors allowed by other sections of this Code , the demand factor for general-use receptacles shall be permitted to be calculated in accordance with Table 517.22(A).

Table 517.22(A) Demand Factors for General-Use Receptacles in Health Care Facilities

Portion of Receptacle Load to Which Demand Factor Applies	Demand Factor (%)
First 5.0 kVA or less	100
Second 5.0 kVA to 10kVA	50
Remainder over 10 kVA	25

Informational Note: See 220.14(l) for the calculation of general-use receptacle loads.

(B) Receptacles for Designated Equipment.

Individual branch circuits supplying receptacles for equipment shall be permitted to be calculated in accordance with Table 517.22(B).

Table 517.22(B) Demand Factors for Equipment Supplied by Individual Branch Circuits in Health Care Facilities

Equipment Supplied by Individual Branch Circuits	Demand Factor (%)
Largest five connected loads	100
Six or more connected loads	50

Informational Note: See 220.60 for noncoincident load calculations.

Supplemental Information

File Name	Description	Approved
NEC_CMP15_SR8598_517.22.docx	For staff use	

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 16:57:40 EDT 2021

Committee Statement

Committee Statement: These demand factors for receptacle loads were developed by the joint task group of CMP-15/CMP-2 and are correlated with Second Revision SR-8097 (CMP-2). The charging text of 517.22 was revised to reference 220.48, and subsections (A) and (B)

and associated Tables 517.22(A) and 517.22(B), having identical values to Tables 220.48(A) and 220.48(B), respectively, were deleted.

The CMP2/CMP15 task group was formed to resolve a correlation issue that resulted from actions taken during the first draft of the 2023 NEC. The task group was charged with proposing language that would resolve the correlation issue with feedback from CMP2, CMP15, and other key contributors. The recommended revision would place a permissive rule in Article 220 to point users to an optional method in Article 517 for patient care spaces in proposed 220.48(A). A new 220.48(B) is also proposed to point the user to the demand factors for diagnostic imaging and treatment equipment and to increase usability of the code.

Response SR-8598-NFPA 70-2021

Message:

[Public Comment No. 1884-NFPA 70-2021 \[Section No. 517.22\]](#)

[Public Comment No. 561-NFPA 70-2021 \[Section No. 517.22\]](#)

[Public Comment No. 1822-NFPA 70-2021 \[Section No. 517.22\]](#)

[Public Comment No. 929-NFPA 70-2021 \[Section No. 517.22\]](#)



Second Revision No. 8601-NFPA 70-2021 [Section No. 517.25]

517.25 Essential Electrical Systems for Health Care Facilities.

Type 1 and Type 2 essential electrical systems (EES) for health care facilities shall comprise separate branches capable of supplying a limited amount of lighting and power service, which is considered essential for life safety and orderly cessation of procedures during the time normal electrical service is interrupted for any reason.

Informational Note: See NFPA 99-2021, *Health Care Facilities Code*, for information on ~~the need for an~~ essential electrical systems .

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 17:20:15 EDT 2021

Committee Statement

Committee Statement: The informational note has been revised to be informational only and not a requirement.

Response Message: SR-8601-NFPA 70-2021

[Public Comment No. 931-NFPA 70-2021 \[Section No. 517.25\]](#)



Second Revision No. 8696-NFPA 70-2021 [Section No. 517.30]

517.30 Sources of Power.

(A) Two Independent Power Sources.

~~Essential electrical systems shall have a minimum of the following two independent sources of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted. [99: 6.7.1.1.2]~~ Essential electrical systems (EES) shall have two or more independent sources (or sets of sources). One on-site source (or sets of sources) shall be sized to supply the entire EES. The other independent source (or sets of sources) shall be sized to supply the entire EES and shall be permitted to be located on-site or off-site. Additional sources other than the first two independent sources shall be permitted to be sized to supply the intended load.

Informational Note: An example of a set of sources may be several generators that combined serve the entire EES.

~~(B) Types of Normal Power Sources.~~

~~Normal power sources shall be permitted to be any of the following:~~

- ~~(0) Utility supply power~~
- ~~(0) Generation units~~
- ~~(0) Health care microgrid~~
- ~~(0) Fuel cells~~

~~(B) Types of Alternate Power Sources for the EES .~~

~~Alternate power~~ Power sources for the EES shall be permitted to be any of those specified in 517.30(B)(1)517.30(C)(4) through (C)(5) (B)(5) .

[Detail SR-8666](#)

(1) Utility Supply Power.

Where utility power is used as the normal source, utility power shall not ~~be permitted to be~~ used as the alternate source unless permitted elsewhere in this article.

Informational Note: See 517.35 and 517.45 for essential system loads that can be supplied from dual sources of utility supply power.

(2) Generating Units.

~~Where the normal source of power consists of generating units on the premises, the alternate source shall be either another generating set or an external utility service. [99: 6.7.1.1.3]~~

(3) Fuel Cell Systems.

Fuel cell systems shall be permitted to serve as the alternate power source for all or part of an ~~essential electrical system EES~~ . [99:6.7.1.5.1]

(a) Installation of fuel cells shall comply with the requirements in Parts I through VII of Article 692 for 1000 volts or less and Part VIII for over 1000 volts.

(b) $N + 1$ units shall be provided where N units have sufficient capacity to supply the demand load of the portion of the system served.

(c) Systems shall be able to assume loads within 10 seconds of loss of normal power source.

(d) Systems shall have a continuing source of fuel supply, together with sufficient on-site fuel storage for the essential system type.

(e) Where life safety and critical portions of the distribution system are present, a connection shall be provided for a portable diesel generator.

Informational Note: See NFPA 853-2020, *Standard for the Installation of Stationary Fuel Cell Power Systems*, for information on installation of stationary fuel cells.

(4) Energy Storage Systems.

Energy storage systems shall be permitted to serve as the alternate source for all or part of an ~~essential electrical system EES~~ .

Informational Note: See NFPA 111-2019 2022 , *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, for information on the installation of energy storage systems.

(5) Health Care Microgrid.

~~Essential electrical systems EES~~ shall be permitted to be supplied by a health care microgrid that also supplies nonessential loads. The health care microgrid shall be permitted to share distributed resources with the normal system. Health care microgrid systems shall be designed with sufficient reliability to provide effective facility operation consistent with the facility emergency operations plan. Health care microgrid system components shall not be compromised by failure of the normal source.

~~(0) If health care microgrid power is used as the normal source, health care microgrid power shall not be permitted to be used as the alternate source.~~

~~(0) ~~Essential electrical systems shall be permitted to be supplied by a health care microgrid that also supplies nonessential loads. The health care microgrid shall be permitted to share distributed resources with the normal system. Health care microgrid systems shall be designed with sufficient reliability to provide effective facility operation consistent with the facility emergency operations plan. Health care microgrid system components shall not be compromised by failure of the normal source.~~~~

Informational Note: See NFPA 99-2021, *Health Care Facilities Code*, for information on health care microgrids.

(C) Location of ~~Essential Electrical System EES~~ Components.

~~Essential electrical system EES~~ components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [99:6.2.4.1]

(1) Services.

Installation of electrical service distribution equipment shall be located to reduce possible interruption of normal electrical services resulting from natural or manmade causes as well as internal wiring and equipment failures.

(2) Feeders.

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [99:6.2.4.3]

Informational Note: Facilities in which the normal source of power is supplied by two or more separate central station-fed services experience greater than normal electrical service reliability than those with only a single feed. Such a dual source of normal power consists of two or more electrical services fed from separate generator sets or a utility distribution network that has multiple power input sources and is arranged to provide mechanical and electrical separation so that a fault between the facility and the generating sources is not likely to cause an interruption of more than one of the facility service feeders.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP_15_SR8696_517.30.docx	For staff use	

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Mon Nov 01 10:31:00 EDT 2021

Committee Statement

Committee Statement: There is now no meaningful distinction between a "normal" source and an "essential system" source. The essence of the issue is that some loads - the essential system - must have multiple sources and multiple feeders to ensure reliability of service in the loss of any one source or feeder. And, other loads - the normal system - do not need to have redundancy. NFPA 99 has made a number of important revisions to clarify the needed performance of these various sources to ensure reliable power to essential systems. The changes suggested here are to ensure correlation with NFPA 99.

Response Message: SR-8696-NFPA 70-2021

[Public Comment No. 1692-NFPA 70-2021 \[Section No. 517.30\]](#)



Second Revision No. 8604-NFPA 70-2021 [Section No. 517.34(A)]

(A) Task Illumination, Fixed Equipment, and ~~Selected~~ Select Receptacles.

The critical branch shall supply power for task illumination, fixed equipment, select receptacles, and select power circuits serving the following spaces and functions related to patient care:

- (1) Category 1 spaces where deep sedation or general anesthesia is administered, task illumination, select receptacles, and fixed equipment
- (2) Task illumination and select receptacles in the following:
 - a. Patient care spaces, including infant nurseries, selected acute nursing areas, psychiatric bed areas (omit receptacles), and ward treatment rooms
 - b. Medication preparation spaces
 - c. Pharmacy dispensing spaces
 - d. Nurses' stations — unless adequately lighted by corridor luminaires
- (3) Additional specialized patient care task illumination and receptacles, where needed
- (4) Nurse call systems
- (5) Blood, bone, and tissue banks
- (6) Telecommunications entrance facility, telecommunications equipment rooms, and telecommunication rooms and equipment in these rooms
- (7) Task illumination, select receptacles, and select power circuits for the following areas:
 - a. Category 1 or 2 spaces with at least one duplex receptacle per patient bed location, and task illumination as required by the governing body of the health care facility
 - b. Angiographic labs
 - c. Cardiac catheterization labs
 - d. Coronary care units
 - e. Hemodialysis rooms or areas
 - f. Emergency room treatment areas (select)
 - g. Human physiology labs
 - h. Intensive care units
 - i. Postoperative recovery rooms (select)
- (8) Clinical IT-network equipment
- (9) Wireless phone and paging equipment for clinical staff communications
- (10) Additional task illumination, receptacles, and select power circuits needed for effective facility operation, including single-phase fractional horsepower motors, which are permitted to be connected to the critical branch

[99:6.7.5.1.3.2]

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 17:49:42 EDT 2021

Committee Statement

Committee Statement: The title of 517.34(A) has been revised to “select” instead of “selected” to avoid confusion with the defined term “selected receptacles”

Response Message: SR-8604-NFPA 70-2021

[Public Comment No. 932-NFPA 70-2021 \[Section No. 517.34\(A\)\]](#)



Second Revision No. 8697-NFPA 70-2021 [Section No. 517.41]

517.41 Required Power Sources.

(A) ~~Two~~ Independent Power Sources.

~~Essential electrical systems shall have a minimum of the following two independent sources of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted. [99: 6.7.1.2.2]~~ Essential electrical systems (EES) shall have two or more independent sources (or sets of sources). One on-site source (or sets of sources) shall be sized to supply the entire EES. The other independent source (or sets of sources) shall be sized to supply the entire EES and shall be permitted to be located on-site or off-site. Additional sources other than the first two independent sources shall be permitted to be sized to supply the intended load.

Information Note: An example of a set of sources may be several generators that combined serve the entire EES.

(B) ~~Types of~~ Power Sources.

~~Where the normal source consists of generating units on the premises, the alternate power source shall be either another generating set or an external utility service. [99: 6.7.1.1.3]~~

(B) Location of Essential Electrical System EES Components.

~~Essential electrical system EES components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [99:6.2.4.1]~~

Installations of electrical services shall be located to reduce possible interruption of normal electrical services resulting from similar causes as well as possible disruption of normal electrical service due to internal wiring and equipment failures. [99:6.2.4.2]

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [99:6.2.4.3]

Supplemental Information

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Submitter Information Verification

Committee: NEC-P15

Submittal Date: Mon Nov 01 10:35:10 EDT 2021

Committee Statement

Committee Statement: There is now no meaningful distinction between a "normal" source and an "essential system" source. The essence of the issue is that some loads - the essential system - must have multiple sources and multiple feeders to ensure reliability of service in the loss of any one source or feeder. And, other loads - the normal system - do not need to have redundancy. NFPA 99 has made a number of important revisions to clarify the needed performance of these various sources to ensure reliable power to essential systems. The changes suggested here are to ensure correlation with NFPA 99.

Response SR-8697-NFPA 70-2021

Message:

[Public Comment No. 1694-NFPA 70-2021 \[Section No. 517.41\]](#)



Second Revision No. 8606-NFPA 70-2021 [Section No. 517.70]

517.70 Applicability.

Nothing in this part shall be construed as specifying safeguards against possible radiation or magnetic fields.

Informational Note No. 1: Radiation safety and performance requirements of several classes of X-ray equipment are regulated under Public Law 90-602 and are enforced by the Department of Health and Human Services.

Informational Note No. 2: Information on radiation protection by the National Council on Radiation Protection and Measurements is published as *Reports of the National Council on Radiation Protection and Measurement*. These reports are obtainable from NCRP Publications, P.O. Box 30175, Washington, DC 20014.

Informational Note No. 3: ~~Diagnostic~~ Examples of diagnostic imaging equipment ~~includes can include~~, but is are not limited to, the following:

- (1) General radiographic (X-ray) equipment (mobile and fixed)
- (2) General fluoroscopic equipment (mobile and fixed)
- (3) Interventional equipment (mobile and fixed)
- (4) Bone mineral density equipment
- (5) Dental equipment
- (6) Computerized tomography (CT) equipment
- (7) Positron emission tomography (PET) equipment
- (8) Nuclear medicine equipment
- (9) Mammography equipment
- (10) Magnetic resonance (MR) equipment
- (11) Diagnostic ultrasound equipment
- (12) Electrocardiogram equipment

Informational Note No. 4: ~~Treatment equipment includes~~ Examples of treatment equipment can include, but is are not limited to, the following:

- (1) Linear accelerators
- (2) Gamma knife
- (3) Cyber knife
- (4) Proton therapy
- (5) Tomotherapy

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 17:58:52 EDT 2021

Committee Statement

Committee Statement: Informational note 3 and 4 have been changed to make it clear the list is examples.

Response Message: SR-8606-NFPA 70-2021

[Public Comment No. 1024-NFPA 70-2021 \[Section No. 517.70\]](#)

[Public Comment No. 1417-NFPA 70-2021 \[Section No. 517.70\]](#)



Second Revision No. 8607-NFPA 70-2021 [Section No. 517.73]

517.73 Rating of Supply Conductors and Overcurrent Protection.

(A) Branch Circuits.

The ampacity of supply branch-circuit conductors and the current rating of overcurrent protective devices shall not be less than 50 percent of the momentary rating or 100 percent of the long-time rating, whichever is greater.

(B) Feeders.

The ampacity of supply feeders and the current rating of overcurrent protective devices supplying two or more branch circuits supplying diagnostic imaging and treatment equipment shall not be less than 50 percent of the momentary demand rating of the largest unit, plus ~~40~~ 25 percent of the momentary demand rating of the next largest unit, plus ~~5~~ 10 percent of the momentary demand rating of each additional unit.

Informational Note No. 1: The minimum conductor size for branch and feeder circuits is also governed by voltage regulation requirements. For a specific installation, the manufacturer usually specifies minimum distribution transformer and conductor sizes, rating of disconnecting means, and overcurrent protection.

Informational Note No. 2: The ampacity of the branch-circuit conductors and the ratings of disconnecting means and overcurrent protection for diagnostic imaging and treatment equipment are usually designated by the manufacturer for the specific installation.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 18:02:07 EDT 2021

Committee Statement

Committee Statement: The study has not been completed so the factors need to revert back to the factors in the 2020 edition.

Response Message: SR-8607-NFPA 70-2021

[Public Comment No. 1696-NFPA 70-2021 \[Section No. 517.73\]](#)



Second Revision No. 8503-NFPA 70-2021 [Section No. 518.2(C)]

(C) Theatrical Areas.

Where any such building or structure, or portion of a building or structure, contains a projection booth or stage platform or area for the presentation of theatrical or musical productions, either fixed or portable, the wiring for that area, including associated audience seating areas, and all equipment that is used in the referenced area, and portable equipment and wiring for use in the production that will not be connected to permanently installed wiring, shall comply with Article 520.

Informational Note: See the local building code or, in its absence, NFPA 101-2021, *Life Safety Code*, for methods of determining population capacity.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 10:59:02 EDT 2021

Committee Statement

Committee Statement: The panel accepts the Correlating Committee suggestion for increased clarity and usability.

Response Message: SR-8503-NFPA 70-2021

[Public Comment No. 1015-NFPA 70-2021 \[Section No. 518.2\(C\)\]](#)



Second Revision No. 8653-NFPA 70-2021 [Section No. 518.5]

518.5 Supply.

~~Portable switchboards and portable power distribution equipment shall be supplied only from listed power outlets of sufficient voltage and ampere rating. Such power outlets shall be protected by overcurrent devices. Such overcurrent devices and power outlets shall not be accessible to the general public. Provisions for connection of an equipment grounding conductor shall be provided. The neutral conductor of feeders supplying solid-state phase-control, 3-phase, 4-wire dimmer systems shall be considered a current-carrying conductor for purposes of ampacity adjustment. The neutral conductor of feeders supplying solid-state sine-wave, 3-phase, 4-wire dimming systems shall not be considered a current-carrying conductor for purposes of ampacity adjustment.~~

Portable switchboards, portable power distribution equipment, and commercial appliance outlet centers shall be installed in accordance with 518.5(A) through (C).

(A) Power Outlets and Commercial Appliance Outlet Centers.

(1) Overcurrent Protection.

Power outlets and commercial appliance outlet centers shall provide overcurrent protection or shall be protected by overcurrent devices.

(2) Accessibility.

Overcurrent devices, power outlets, and commercial appliance outlet centers shall not be accessible to the general public.

(3) Equipment Grounding Conductor Connections.

Connecting means for an equipment grounding conductor shall be provided.

(4) Markings.

Power outlets and commercial appliance outlet centers shall be marked as follows:

FOR USE BY QUALIFIED PERSONS ONLY.

RISK OF ELECTRIC SHOCK. Disconnect all power before servicing.

Disconnecting means location:

(5) Panelboard Orientation.

A panelboard installed in a listed commercial appliance outlet center designed for in-floor mounting shall be permitted to be orientated in the face-up position, if such orientation is part of the listing, and 408.43 shall not apply.

(B) Portable Switchboards and Portable Power Distribution Equipment.

Portable switchboards and portable power distribution equipment shall be supplied only from listed power outlets or listed commercial appliance outlet centers, each having sufficient voltage and ampere ratings.

(C) Neutral Conductor of Feeders Supplying Solid State Dimmer Systems.

The neutral conductor of feeders supplying solid-state phase control, 3-phase, 4-wire dimmer systems shall be considered a current-carrying conductor for purposes of ampacity adjustment.

The neutral conductor of feeders supplying solid-state sine wave, 3-phase, 4-wire dimming systems shall not be considered a current-carrying conductor for purposes of ampacity adjustment.

Exception: The neutral conductor of feeders supplying systems that use or are capable of using both phase-control and sine-wave dimmers shall be considered as current-carrying for purposes of ampacity adjustment.

Informational Note: See ~~520.2~~ Article 100 for definitions of solid-state dimmer types.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP15_SR8653_518.5.docx	For staff use	

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Fri Oct 29 13:20:04 EDT 2021

Committee Statement

Committee Statement: The section was revised into a list format with titled subdivisions for clarity and usability as there were number of requirements in a single paragraph. In addition, it was revised to specifically reference commercial appliance outlet centers which can have unique features such as a panelboard installed in face up position and clarifies that the panelboard orientation must be part of the listing. For additional safety, marking requirements were added to power outlets and commercial appliance outlet centers. The informational note regarding solid-state dimmer types was revised to reflect the definitions formerly contained in 520.2 are now located in Article 100.

Response Message: SR-8653-NFPA 70-2021

Public Comment No. 2223-NFPA 70-2021 [Section No. 518.5]



Second Revision No. 8505-NFPA 70-2021 [Section No. 520.21]

520.21 General.

Fixed stage switchboards shall comply with 520.21(1) through (4) the following :

- (1) Fixed stage switchboards shall be listed.
- (2) Fixed stage switchboards shall be readily accessible but shall not be required to be located on or adjacent to the stage. Multiple fixed stage switchboards shall be permitted at different locations.
- (3) A fixed stage switchboard shall contain overcurrent protective devices for all branch circuits supplied by that switchboard.
- (4) A fixed stage switchboard shall be permitted to supply both stage and nonstage equipment.
- (5) Fixed stage switchboards shall comply with the marking and working space requirements in 408.18(C), but shall not be required to comply with the load terminal location requirements in 408.18(C)(1), (C)(2), and (C)(3).

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:06:50 EDT 2021

Committee Statement

Committee Statement: The panel modified the content of 520.21 to incorporate the contents of approved TIA 1573.

Response Message: SR-8505-NFPA 70-2021

Public Comment No. 10-NFPA 70-2021 [Section No. 520.21]



Second Revision No. 8508-NFPA 70-2021 [Section No. 520.25(A)]

(A) Disconnection and Overcurrent Protection.

Where ~~If~~ dimmers are installed in ungrounded conductors, each dimmer shall have overcurrent protection not greater than 125 percent of the dimmer rating and shall be disconnected from all ungrounded conductors where the master or individual switch or circuit breaker supplying such dimmer is in the open position.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:10:47 EDT 2021

Committee Statement

Committee Statement: The panel accepts the Correlating Committee direction to comply with section 3.3.4 of the NEC Style Manual.

Response Message: SR-8508-NFPA 70-2021

[Public Comment No. 1016-NFPA 70-2021 \[Section No. 520.25\(A\)\]](#)



Second Revision No. 8509-NFPA 70-2021 [Section No. 520.53]

520.53 Construction.

Portable stage switchboards shall be listed and shall comply with 520.53(A) through (E). The load terminal location requirements in 408.18(C)(1), (C)(2), and (C)(3) shall not apply to portable stage switchboards.

(A) Pilot Light.

A pilot light shall be provided for each ungrounded conductor feeding the switchboard. The pilot light(s) shall be connected to the incoming feeder so that operation of the main overcurrent protective device or master switch shall not affect the operation of the pilot light(s).

(B) Neutral Terminal.

In portable switchboard equipment designed for use with 3-phase, 4-wire with ground supply, the current rating of the supply neutral terminal, and the ampacity of its associated busbar or wiring, or both, shall have an ampacity equal to at least twice the ampacity of the largest ungrounded supply terminal.

Exception: Where portable switchboard equipment is specifically constructed and identified to be internally converted in the field, in an approved manner, from use with a balanced 3-phase, 4-wire with ground supply to a balanced single-phase, 3-wire with ground supply, the supply neutral terminal and its associated busbar, wiring, or both, shall have an ampacity equal to at least that of the largest ungrounded single-phase supply terminal.

(C) Single-Pole Separable Connectors.

Single-pole separable connectors shall comply with 406.13. Sections 400.14, 406.7, and 406.8 shall not apply to listed single-pole separable connectors and single-conductor cable assemblies utilizing listed single-pole separable connectors. Where paralleled sets of current-carrying, single-pole separable connectors are provided as input devices, they shall be prominently labeled with a warning indicating the presence of internal parallel connections.

(D) Supply Feed-Through.

Where a portable stage switchboard contains a feed-through outlet of the same rating as its supply inlet, the feed-through outlet shall not require overcurrent protection in the switchboard.

(E) Interior Conductors.

All conductors other than busbars within the switchboard enclosure shall be stranded.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:12:37 EDT 2021

Committee Statement

Committee Statement: As of June 29, 2021 TIA 1574 had passed final ballot with CMP15 and the Correlating Committee. It is awaiting Standards Council approval. I am submitting this public

comment, which is a duplicate of TIA 1574, to insure that the contents of TIA 1574 are included in the Second Revision. The TIA 1574 Substantiation is also included below.

408.18(c) 1, 2, and 3 were added to the NEC in the 2020 edition. The purpose of these sections was to minimize the risk of shock and/or arc flash when making or modifying connections to an energized switchboard. Typical listed stage switchboards covered by 520.53 are high-density units containing dead-front dimmer or relay modules that plug onto busbars and load circuit connectors. They are not general-purpose switchboards, but special-purpose switchboards covered by the UL334 Outline of Investigation for Theater Lighting Distribution and Control Equipment. This document in turn requires certain, but not all, portions of the UL891 Standard for Switchboards to be applied to these devices. 1. The listing conditions of these devices prohibit work of any kind on connections while the switchboard is energized. This prohibition is part of the warnings and instructions for the switchboard. 2. From a practical point of view, the construction of these units does not physically allow for wiring changes while energized due to their high density of busbars and load connections. 3. Even if it were practically possible or allowed by the switchboard listing, which it is not, there is no plausible use case for a stage switchboard where work on connections would be required while the switchboard remained energized. 4. There is no practical way to modify the design of these products to comply with 408.18(C) 1, 2, and 3. 5. Similar constructions from multiple manufacturers have been in safe use for more than 40 years. None of these constructions could likely comply with 408.18(C) 1, 2, or 3. Those requirements are aimed at general-purpose switchboards and their use cases that require modification of connections while the switchboard is energized. Such use cases do not apply to stage switchboards.

Response SR-8509-NFPA 70-2021

Message:

[Public Comment No. 12-NFPA 70-2021 \[Section No. 520.53\]](#)



Second Revision No. 8515-NFPA 70-2021 [Section No. 520.54(K)]

(K) Qualified Personnel Persons .

The routing of portable supply conductors, the making and breaking of supply connectors and other supply connections, and the energization and de-energization of supply services shall be performed by qualified ~~personnel~~ persons , and portable switchboards shall be so marked, indicating this requirement in a permanent and conspicuous manner.

Exception: A portable switchboard shall be permitted to be connected to a permanently installed supply receptacle by other than qualified ~~personnel~~ persons provided that the supply receptacle is protected for its current rating by an overcurrent device of not greater than 150 amperes, and where the receptacle, interconnection, and switchboard comply with all of the following:

- (1) *They employ listed multipole connectors for every supply interconnection.*
- (2) *They prevent access to all supply connections by the general public.*
- (3) *They employ listed extra-hard usage multiconductor cords or cables with an ampacity not less than the load and not less than the ampere rating of the connectors.*

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:24:31 EDT 2021

Committee Statement

Committee Statement: The section was revised by replacing “qualified personnel” with the defined term “qualified person” , shown in the plural in accordance with 3.3.3 of the NEC Style Manual. This action is to correlate with the action taken on PC 1019.

Response Message: SR-8515-NFPA 70-2021



Second Revision No. 8511-NFPA 70-2021 [Section No. 520.68(A)(4)]

(4) Luminaire Supply Cords.

Listed hard usage supply cords shall be permitted to supply luminaires ~~where~~ if all of the following conditions are met:

- (1) The supply cord is not longer than 2.0 m (6.6 ft).
- (2) The supply cord is attached at one end to the luminaire or a luminaire-specific listed connector that mates with a panel-mounted inlet on the body of the luminaire.
- (3) The supply cord is protected by an overcurrent protective device of not more than 20 amperes.
- (4) The luminaire is listed.
- (5) The supply cord is not subject to physical damage.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:15:37 EDT 2021

Committee Statement

Committee Statement: The panel accepts the Correlating Committee direction to comply with section 3.3.4 of the NEC Style Manual.

Response Message: SR-8511-NFPA 70-2021

[Public Comment No. 1017-NFPA 70-2021 \[Section No. 520.68\(A\)\(4\)\]](#)



Second Revision No. 8512-NFPA 70-2021 [Section No. 520.68(D)]

(D) Special-Purpose MultiCircuit circuit Cable Systems.

Special-purpose multicircuit cable systems shall comply with the following requirements:

- (1) Branch circuits shall be rated at not more than 20 amperes and not more than 150 volts to ground.
- (2) Trunk cable types shall be extra-hard usage (hard service) or hard usage (junior hard service).
- (3) The ampacity of trunk cables shall be determined in accordance with Table 520.44(C) (2)(1).
- (4) Trunk cables, breakout assemblies, and multicircuit enclosures shall be listed.
- (5) Section 406.8 shall not apply to multicircuit, multipole plugs or receptacles that are part of a special-purpose multicircuit cable system.
- (6) All multicircuit, multipole connectors shall be clearly marked with the voltage of the branch circuits serviced by the connector.
- (7) Installation and operation shall be performed by qualified ~~personnel~~ persons .

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:18:06 EDT 2021

Committee Statement

Committee Statement: The panel accepts the correlating committee direction to modify 520.68(D) to use a defined term instead of "personnel".

Response Message: SR-8512-NFPA 70-2021

[Public Comment No. 1019-NFPA 70-2021 \[Section No. 520.68\(D\)\]](#)

**Second Revision No. 8715-NFPA 70-2021 [Section No. 522.22]****522.22** Conductor Ampacity.

Ampacities for conductors sized 16 AWG and smaller shall be as specified in Table 522.22.

Table 522.22 Conductor Ampacity Based on Copper Conductors with 60°C and 75°C Insulation in an Ambient Temperature of 30°C

<u>Conductor Size</u> <u>(AWG)</u>	<u>Ampacity</u>	
	<u>60°C</u>	<u>75°C</u>
30	—	0.5
28	—	0.8
26	—	1
24	2	2
22	3	3
20	5	5
18	7	7
16	10	10

Notes:

1. For ambient temperatures other than 30°C, use temperature correction factors provided in 310.15(B)(1) shall be used.
2. Ampacity for conductors with 90°C or greater insulation shall be based on ampacities in the 75°C column.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Tue Nov 09 18:31:15 EST 2021

Committee Statement

Committee Statement: This editorial second revision is created by NFPA staff for compliance with Section 2.3.1 of the NEC Style Manual regarding mandatory requirements expressed in tables and figures.

Response Message: SR-8715-NFPA 70-2021



Second Revision No. 8520-NFPA 70-2021 [Section No. 525.21(A)]

(A) Disconnecting Means.

A means to disconnect each portable structure from all ungrounded conductors shall be provided. The disconnecting means shall be located within sight of and within 1.8 m (6 ft) of the operator's station. The disconnecting means shall be readily accessible to the operator, including when the ride is in operation. ~~Where~~ If accessible to unqualified persons, the disconnecting means shall be lockable. A shunt trip device that opens the fused disconnect or circuit breaker ~~where~~ if a switch located in the ride operator's console is closed shall be a permissible method of opening the circuit.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:48:41 EDT 2021

Committee Statement

Committee Statement: The panel accepts the Correlating Committee direction to comply with Section 3.3.4 of the NEC Style Manual.

Response Message: SR-8520-NFPA 70-2021

[Public Comment No. 1020-NFPA 70-2021 \[Section No. 525.21\(A\)\]](#)



Second Revision No. 8522-NFPA 70-2021 [Section No. 525.22(A)]

(A) Construction.

Boxes shall be designed so that no live parts are exposed except where necessary for examination, adjustment, servicing, or maintenance by qualified persons. ~~Where~~ If installed outdoors, the box shall be of weatherproof construction and mounted so that the bottom of the enclosure is not less than 150 mm (6 in.) above the ground.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:50:27 EDT 2021

Committee Statement

Committee Statement: The panel accepts the Correlating Committee direction to comply with Section 3.3.4 of the NEC Style Manual.

Response Message: SR-8522-NFPA 70-2021

[Public Comment No. 1021-NFPA 70-2021 \[Section No. 525.22\(A\)\]](#)



Second Revision No. 8523-NFPA 70-2021 [Section No. 530.1]

530.1 Scope.

The requirements of this article shall apply to motion picture and television studios in facilities and locations staffed by qualified ~~personnel~~ persons , except as provided in 520.1. Such occupancies shall include those using either electronic or film cameras for image capture.

Informational Note: See NFPA 40-2019, *Standard for the Storage and Handling of Cellulose Nitrate Film*, for methods of protecting against cellulose nitrate film hazards.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:54:46 EDT 2021

Committee Statement

Committee Statement: The panel accepts the Correlating Committee direction to modify 530.1 to use a defined term instead of "personnel".

Response Message: SR-8523-NFPA 70-2021

[Public Comment No. 1022-NFPA 70-2021 \[Section No. 530.1\]](#)



Second Revision No. 8524-NFPA 70-2021 [Section No. 530.11]

530.11 Branch Circuits.

A branch circuit of any size supplying one or more receptacles shall be permitted to supply stage set lighting loads.

The GFCI requirements in of 210.8(B), excluding 210.8(B)(6), shall apply.

Branch circuits supplying egress lighting, life-critical stunts, life-critical special effects, or any other condition where a nonorderly shutdown might introduce additional or increased hazards shall not be protected by GFCIs.

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 11:57:49 EDT 2021

Committee Statement

Committee Statement: A specific reference to GFCI was added for clarity and to improve searchability. Note that the intent is to exclude outdoor applications using the FR reference to 210.8(B)(6).

Response Message: SR-8524-NFPA 70-2021

[Public Comment No. 1074-NFPA 70-2021 \[Section No. 530.11\]](#)

[Public Comment No. 2227-NFPA 70-2021 \[Section No. 530.11\]](#)



Second Revision No. 8526-NFPA 70-2021 [Section No. 530.22(E)]

(E)– Connectors.

~~Connectors shall be rated in amperes and designed so that differently rated devices cannot be connected together.~~

~~Exception: 125-volt, 20-ampere, nonlocking (T-slot) receptacles shall be permitted to accept a 15-ampere attachment plug of the same voltage rating.~~

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:03:24 EDT 2021

Committee Statement

Committee Statement: The text in 530.22(E) was deleted as it was redundant and therefore the subsequent two subdivisions were renumbered.

Response Message: SR-8526-NFPA 70-2021

[Public Comment No. 2228-NFPA 70-2021 \[Section No. 530.22\(E\)\]](#)



Second Revision No. 8527-NFPA 70-2021 [Sections 530.22(F), 530.22(G)]

(E) Cable Protection.

Cables shall be protected by bushings where they pass through enclosures and shall be arranged so that tension on the cable is not transmitted to the connections. Where power conductors pass through metal, the requirements of 300.20 shall apply.

(F) Special-Purpose ~~Multi-Circuit~~ Multicircuit Cable Systems.

Special-purpose multicircuit cable systems shall comply with ~~the requirements of~~ 520.68(D).

Submitter Information Verification

Committee: NEC-P15

Submittal Date: Thu Oct 28 12:05:56 EDT 2021

Committee Statement

Committee Statement: The section, formerly 530.22(F), was revised by removing the unnecessary text "the requirements of".

Response Message: SR-8527-NFPA 70-2021

[Public Comment No. 1023-NFPA 70-2021 \[Section No. 530.22\(G\)\]](#)