

Significant Changes  
to the  
2017 National Electrical Code®

## 1. 90.3 Code Arrangement

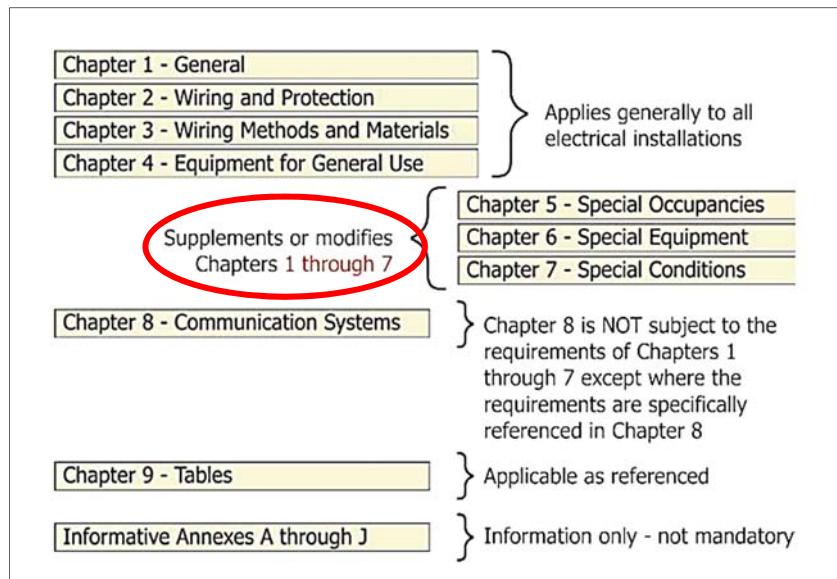


Figure 90.3

other special conditions.

Previously, the code stated that the Chapter 5, 6, and 7 rules supplemented or modified only the requirements in Chapters 1 through 4. The 2017 NEC correctly identifies that these later articles may supplement or modify themselves as well.

Understanding the hierarchy of the rules is essential to interpreting what may appear to be conflicts or inconsistencies in the Code. One example would be the installation of an electric sign in a Class 1 hazardous (classified) area which must meet the rules of Article 600, but also comply with the requirements in Articles 500 and 501.

**Chapter 8** is a stand-alone article that contains the requirements for communications systems, such as telephone systems, antenna wiring, CATV, and network-powered broadband systems which aren't subject to the general requirements of Chapters 1 through 4 or the special requirements of Chapters 5 through 7 unless there's a specific reference in Chapter 8.

**Chapter 9** consists of tables applicable as referenced in the NEC. The tables are essential for determining the radius of raceway bends, dimensions of conductors, to calculate raceway sizing for conductor fill, and the power source limitations of Class 2 and Class 3 ac and dc circuits, etc., Figure 90.3 is key to understanding and correctly applying the rules of the NEC.

This Code is divided into the introduction and nine chapters, as shown in Figure 90.3.

Chapters 1, 2, 3, and 4 include general installation requirements, wiring methods, conductor protection, and equipment for general use which apply to all electrical installations.

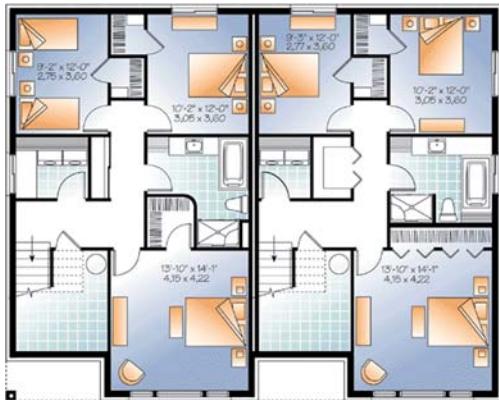
The requirements found in Chapters 5, 6, and 7 apply to special occupancies, special equipment, or

## 2. 100 Definitions

### **Building and Structure**

**2014 NEC Building:** A structure that stands alone or that is cut off from adjoining structures with all openings therein protected by approved fire doors.

**2017 NEC Building:** A structure that stands alone or that is separated from adjoining structures by fire walls.



The definition of the word building was revised and the term "fire doors" was deleted because openings in firewalls are not limited to just doors. Building codes – not the NEC - dictate when and where openings are permitted in separation walls that are required to be fire-rated. This new definition is more in step with the current building code and creates consistent terminology between model codes.

**Structure 2014 NEC:** That which is built or constructed.

**Structure 2017 NEC:** That which is built or constructed, other than equipment.

Section 250.50 requires all buildings and structures to have a grounding



electrode system where all the available electrodes (and if none exist, the made electrodes) are bonded together and to the service or feeder distribution panel. But the existing definition of a structure could include free-standing equipment where the establishment of a grounding electrode system was not intended.

The phrase "other than equipment" was added to the definition to create a real difference between what is deemed to be a structure and therefore required to have a grounding electrode system and a stand-alone piece of listed electrical equipment which is not.



The new definition means that listed electrical equipment can stand alone or it can be mounted on a structure but the listed piece of electrical equipment itself is not considered a structure.

### **3. 110.3(A)(1) Examination, Identification, Installation, Use, & Listing of Equipment.**

In judging equipment, considerations such as the following shall be evaluated: (1) Suitability for installation and use in conformity with the provisions of this Code.

**Informational Note No. 1:** Equipment may be new, reconditioned, refurbished, or remanufactured.

Section 110.3(A) aids installers and inspectors when determining the suitability of equipment: mechanical strength and durability, wire-bending and connection space, electrical insulation, heating and arcing effects, and classification of such things as size, voltage, current

capacity, etc.

In many cases, extending the life of existing equipment may be necessary when the original manufacturer is no longer in business or they no longer produce that item. New replacement parts may not fit in the existing enclosure.

Reconditioned, refurbished, and remanufactured electrical equipment is a practical decision when the equipment has been properly certified and the markings and nameplate requirements have been met.



Occupational Safety and Health Administration

The Code of Federal Regulations Subp. S 1910 applies to electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises, including: yards; carnivals; parking and other lots; mobile homes; recreational vehicles; industrial substations; conductors that connect the installations to a supply of electricity; and other outside conductors

**Approval.** The conductors and equipment required or permitted by this subpart shall be acceptable only if approved.

**110.21 (A)(2) (2) Reconditioned Equipment.** Reconditioned equipment shall be marked with the name, trademark, or other descriptive marking by which the organization responsible for reconditioning the electrical equipment can be identified, along with the date of the reconditioning. Reconditioned equipment shall be identified as “reconditioned” and approval of the reconditioned equipment shall not be based solely on the equipment’s original listing.



**Informational Note:** Industry standards are available for application of reconditioned and refurbished equipment. Normal servicing of equipment that remains within a facility should not be considered reconditioning or refurbishing.

#### **4. 210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.**

For the purposes of this section, when determining distance from receptacles the distance shall be measured as the shortest path the cord of an appliance connected to the receptacle would follow



without piercing a floor, wall, ceiling, or fixed barrier, or passing through a door, doorway, or window.

Inspired by the existing “shortest path” rule in Section 680.22(A)(5) for determining the location of receptacles around permanently installed swimming pools, this added sentence at 210.8 clarifies just how the 6-foot measurement is to be made.

Another dimension clarification was made in both 210.8(A)(7) for dwelling units and 210.8(B)(5) for non-dwelling units which makes it clear that the 6-foot measurement does not extend all directions from the outside edges of the sink.

**Sinks** — where receptacles are installed within 6-feet from the top inside edge of the bowl of the sink.

**210.8(B) Other Than Dwelling Units.** GFCI requirements have been expanded to include other than 15- and 20-amp 125-volt applications and now apply to all single-phase receptacles <150 volts and <50 amps and three-phase receptacles <150 volts and <100 amps.

**(9) and (10) GFCI protection** now applies to 120-volt 15- and 20-amp receptacles in crawl spaces and unfinished basements in all occupancies. The same electrical shock hazards exist in those spaces whether or not they are associated with a dwelling unit.



**(E) Crawl Space Lighting Outlets.** GFCI protection shall be provided for lighting outlets not exceeding 120 volts installed in crawl spaces. Fatal incidents have shown amp guards do not provide appropriate shock protection. The GFCI requirement applies to lighting outlets in both dwellings and non-dwellings.

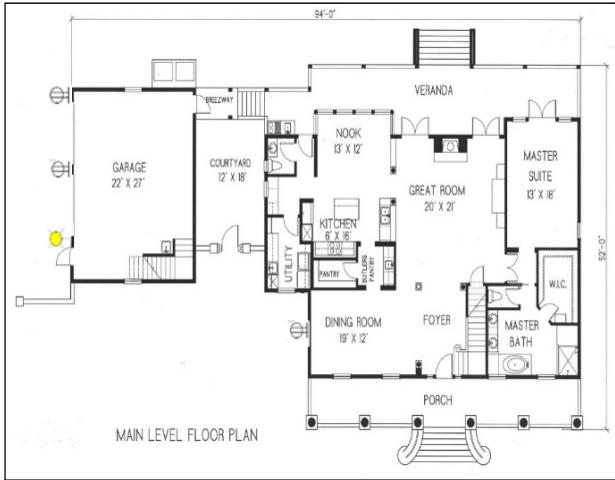
## **5. 210.11(C) Branch Circuits Required.**

**(4) Dwelling Unit Garage Receptacles.** In addition to the number of branch circuits required by other

parts of this section, at least one 120-volt, 20-ampere branch circuit shall be installed to supply receptacle outlets in attached garages and in detached garages with electric power.

This circuit shall have no other outlets.

A single 120-volt branch circuit rated 15-amps is often inadequate for all the equipment and associated apparatus found in residential garages. Electric tools and appliances may require individual branch circuits in addition to the



minimum requirement for a dedicated 120-volt circuit to the general-purpose receptacles.

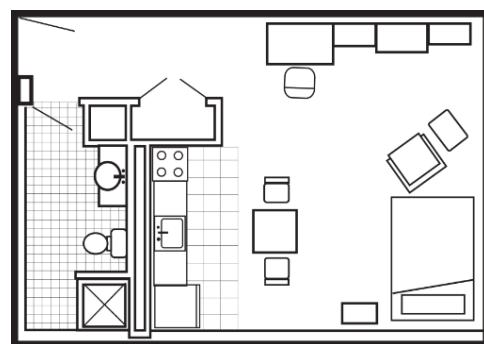
**Exception:** This circuit shall be permitted to supply readily accessible outdoor receptacle outlets.

The allowance is for readily accessible outdoor receptacle outlets to be fed from the 20-amp receptacle branch circuit- but not any lighting load, which to be fed from general purpose lighting circuits. Keeping the lights on in the event of an unexpected outage on the receptacle circuit is safety issue.

## **6. 210.12(C) Guest Rooms and Guest Suites.**

All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels shall be AFCI protected.

Arcing conditions can occur in the wiring and devices in hotel or motel guest rooms just as they could occur in dwelling units and that same level of protection is now required. The code had only required AFCI protection in the guest rooms and suites of hotels and motels when there were permanent provisions for cooking in the room or suite. Defining “permanent provisions for cooking” was problematic when cord-and-plug connected microwave ovens and hot plates were secured in place to prevent theft. The expanded AFCI requirement is not contingent on the presence of portable or permanent cooking provisions in the room or suite.



## **7. 210.52 Dwelling Unit Receptacle Outlets.**

**(A)(7) (1) Spacing.** Receptacles shall be installed such that no point measured horizontally along the floor line of any wall space is more than 6 feet from a receptacle outlet.

**(2) Wall Space.** As used in this section, a wall space shall include the following:



(1) Any space 2-feet or more in width (including space measured around corners) and unbroken along the floor line by doorways and similar openings, fireplaces, and fixed cabinets that do not have countertops or similar work surfaces.

Doorways, fireplaces and similar openings are considered a break in wall space when applying the 6-foot rule and now

countertop work spaces that are part of built-in bookcases are considered a break in a wall space as well. This change clarifies that only those portions of fixed cabinets of any height that do not have a countertop work surface can be viewed as a break in wall space. The wall line of the desktop or work surface is considered wall space and receptacle outlet(s) (at countertop spacing) are required there.

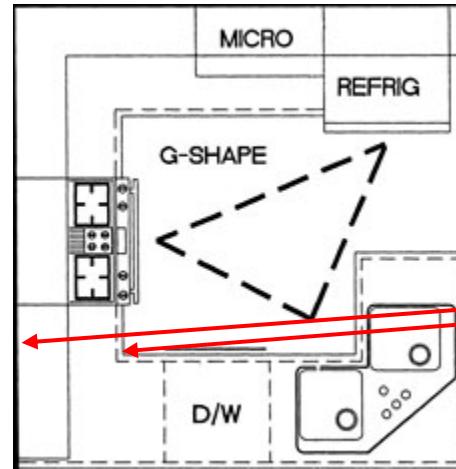
## **8. 210.52(C)(3) Peninsula Countertop Spaces:**

At least one receptacle outlet shall be installed at each peninsular countertop long dimension space with a long dimension of 24-inches or greater and a short dimension of 12-inches or greater. A peninsular countertop is measured from the connected perpendicular wall.

Until now, this measurement has been taken from the point where the peninsula countertop mated with the wall countertop which meant that at least one receptacle was required to be installed on every peninsula.

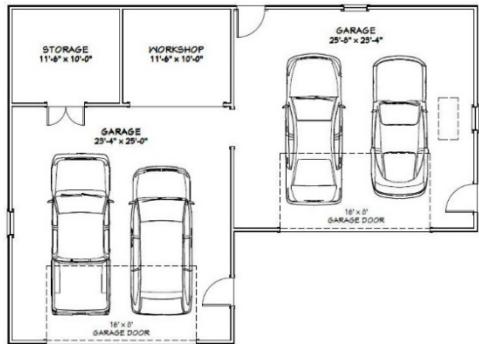
Changing how the long dimension of the peninsula countertop is measured allows a receptacle outlet on the connecting wall to meet the requirement for a receptacle at the peninsula.

Cabinet makers and homeowners will be delighted with this change; contractors and inspectors will be able to stop wrangling about the location of the required receptacle on end of the peninsula.



## **9. 210.52(G) Basements, Garages, and Accessory Buildings.**

For one- and two-family dwellings, at least one receptacle outlet shall be installed in the areas specified



in addition to receptacles required for specific equipment.

**Garages.** In each attached garage and in each detached garage with electric power, at least one receptacle outlet shall be installed in each vehicle bay and not more than 5 1/2 feet above the floor.

The change clarifies that the required number of receptacles cannot be grouped in one location and that the receptacle in the ceiling for the garage door opener does not qualify as the receptacle in that vehicle bay.

## **10. 210.64 Electrical Service Areas.**

At least one 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet shall be installed in an accessible location within 25-feet of the indoor electrical service equipment. The required receptacle outlet shall be located within the same room or area as the service equipment.

**Exception No. 1:** The receptacle outlet shall not be required in one-and-two-family dwellings.

**Exception No. 2:** Where the service voltage is greater than 120 volts to ground, a receptacle outlet shall not be required for services dedicated to equipment covered in Articles 675 and 682.

The receptacle is there to assist workers using 120-volt instruments when examining, testing, monitoring or recording data at the electrical service equipment. Some of these devices are connected for days, weeks or months and reducing extension cord use is a safety consideration.

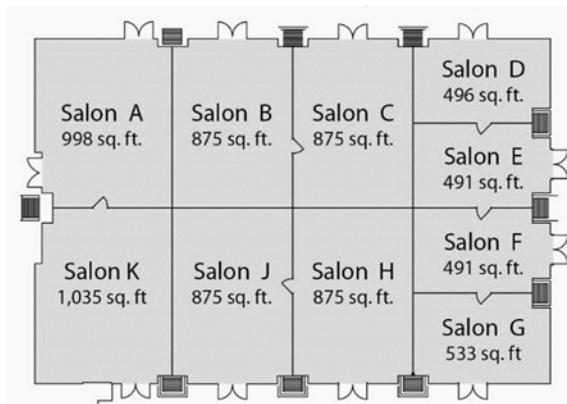
The electric service for stand-alone pumping facilities for center-pivot irrigation equipment or the aerator in bodies of water are generally from 480- or 600- volt ungrounded distribution systems. These services are used to power to a 3-phase machine so a grounded conductor is not extended from the utility supply; a 120-volt reference is not available at the service disconnecting means. Providing a 120-volt receptacle outlet at these locations is unnecessary and would require an additional service conductor or installation of a step-down the transformer.



## **11. 210.71 Meeting Rooms.**

**(A) General.** Each meeting room of not more than 1000 square feet in other than dwelling units shall have outlets for non-locking-type, 125-volt, 15- or 20-ampere receptacles. Where a room or space is provided with movable partition(s), each room size shall be determined with the partition in the position that results in the smallest size meeting room.

**(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 (1) and (2). These receptacle outlets shall be permitted to be located as determined by the designer or building owner.



**(1) Receptacle Outlets in Fixed Walls.** Receptacle outlets shall be installed in accordance with 210.52(A)(1) through (A)(4).

**(2) Floor Receptacle Outlets.** A meeting room that is at least 12 feet wide and that has a floor area of at least 215 square feet shall have at least one receptacle outlet located in the floor at a distance not less than 6 feet from any fixed wall for each 215 square feet or major portion of floor space. \*

At conferences and seminars, extension cords are draped across aisles to a row of laptop computers or duct-taped to the floor behind the podium to supply the projector. Under the 2017 NEC, all non-dwelling unit meeting rooms that fit the specified size criteria will be required to have receptacle outlets. Smaller meeting rooms that are between 215 and 1,000 square feet and at least 12-feet wide will be required to have at least one floor receptacle located not less than 6-feet from any fixed wall. \*

The total number of required receptacles is determined by using the basic wall spacing rules for dwelling units in 210.52, but those at countertop spaces cannot be included in the count. Note that the receptacles do not have to be placed as required by 210.52. The number of receptacle outlets is determined by the code with the actual placement determined by the building owner or designer.

Large meeting rooms, defined as those that are 1,000 square feet or more, are exempt from the any of the new receptacle requirements.

## 12. 250.94 Bonding for Communications Systems

**(B) Other Means.** Connections to an aluminum or copper busbar not less than  $\frac{1}{4}$  in. thick  $\times$  2 in. wide and of sufficient length to accommodate at least three terminations for communication systems in addition to other connections.



New section (B)

Article 800	Communication (Telephone & Data)
Article 810	TV and Radio
Article 820	Cable TV
Article 830	Network-Powered Broadband Communications
Article 840	Premises-Powered Broadband Communications



permits what has

long been used and is considered an acceptable practice in the field. The new exception acknowledges that an IBT not necessary at all service equipment locations or at the disconnecting means at additional buildings or structures.



**Exception to (A) and (B): Means for connecting intersystem bonding conductors are not required where communications systems are not likely to be used.**

This new allowance has already been referred to as the chicken coop or children's playhouse exception.

## 13. 310.15(B)(4)(c) (c) Raceways and Cables Exposed to Sunlight on rooftops.

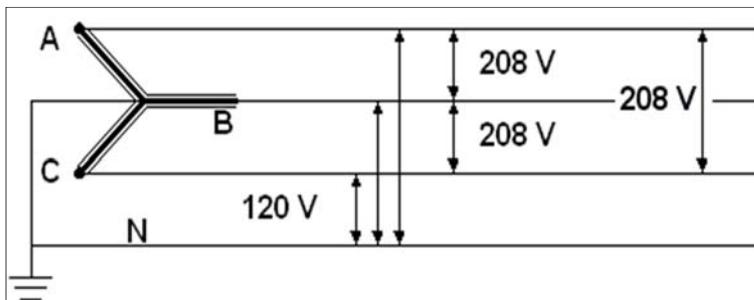
Where raceways or cables are exposed to direct sunlight and located less than  $\frac{7}{8}$  in. above the roof, a temperature adder of 60°F is to be added to the outdoor ambient temperature to determine the ambient temperature for the application of the ampacity correction in accordance with Table 310.15(B)(2)(a).

The deletion of this requirement means that no rooftop temperature adjustment is necessary when raceways or cable assemblies are correctly supported across a roof and not in direct contact with the rooftop surface.



#### **14. 310.15(B)(7) Single-Phase Dwelling Services and Feeders.**

For one-family dwellings and the individual dwelling units of two-family and multifamily dwellings, single-phase feeder conductors consisting of 2 ungrounded conductors and the neutral conductor from a 208Y/120 volt system shall be permitted to be sized in accordance with 310.15(B)(7)(1) through (3).



(2) For 100 to 400-amp feeder conductors supplying the entire load associated with the dwelling shall be permitted to have an ampacity not less than 83 percent of the service rating. (see Annex D, Example D7)

Residential service-entrance and feeder

conductors supplying the entire load may have a marginally higher ampacity in Table 310.15(B)(16) due to the diversity of loads used within dwelling units. In a 208Y/120-volt system current is 120 degrees out-of-phase not 180 degrees as in a 120/240-volt system, which means the neutral conductor of a 208Y/120-volt system is a current-carrying conductor.

#### **15. 336.10 Power and Control Tray Cable: Type TC**

(g) In one- and two-family dwelling units, Type TC-ER cable containing both power and control conductors that is identified for pulling through structural members shall be permitted. Type TC-ER cable used as interior wiring shall be installed per the requirements of Part II of Article 334.



(Exception: Where used to connect a generator and associated equipment having terminals rated 75°C (140°F) or higher, the cable shall not be limited in ampacity by 334.80 or 340.80.

**Informational Note No. 1:** TC-ER cable suitable for pulling through structural members is marked "JP."

Type TC cable is now permitted in one- and two-family dwellings and where not exposed to physical damage and can be installed without a raceway. Type TC cable that meets or exceeds the product standard, UL1277 crush and impact ratings for Type NM cable, Types SE and SER cable and Type MC cable is marked with an "-ER" which stands for Exposed Run. If the cable has also met the joist pull testing will be identified as Type TC-ER-JP.

## **16. 406.12 Tamper-Resistant Receptacles.**

All 15- and 20-ampere, 125- and 250-volt non-locking-type receptacles in the areas specified in 406.12(1) through (7) shall be listed tamper-resistant receptacles.

- (1) Dwelling units in all areas specified in 210.52 and 550.13



- (2) Guest rooms and guest suites of hotels and motels  
(3) Child care facilities  
(4) Preschools and elementary education facilities  
(5) Business offices, corridors, waiting rooms and the like in clinics, medical and dental offices and outpatient facilities  
(6) Subset of assembly occupancies described in 518.2 to include places of waiting transportation, gymnasiums, skating rinks, and auditoriums  
(7) Dormitories

Previously only applicable to dwellings, child care facilities and guest rooms and guest suites, the requirements for tamper-resistant (TR) receptacles have been expanded to locations where small children are likely to congregate. The requirements now apply to 250-volt non-locking-type receptacles.

The existing exceptions for receptacles that are generally inaccessible to children and for replacement non-grounding receptacles remain the only acceptable exclusions in those designated areas.

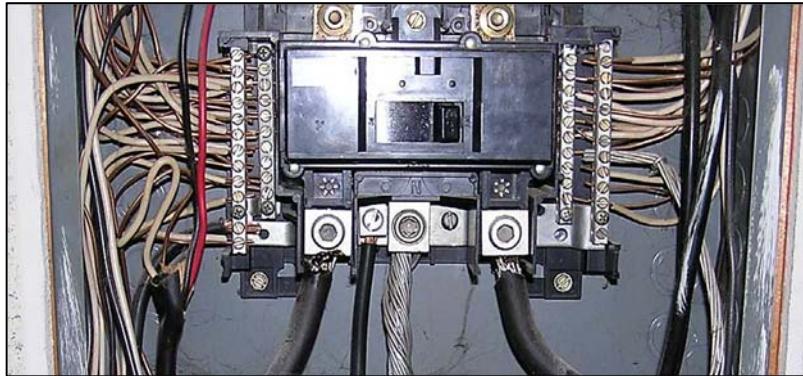
**Exceptions to (1), (2), (3), (4), (5), (6), and (7):** Receptacles in the following locations shall not be required to be tamper resistant:

- (1) Receptacles located more than 5 1/2 feet above the floor  
(2) Receptacles that are part of a luminaire or appliance  
(3) A single receptacle or a duplex receptacle for two appliances located within the dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug-connected in accordance with 400.10(A)(6), (A)(7), or (A)(8)  
(4) Non-grounding receptacles used for replacements as permitted in 406.4(D)(2)(a)



## **17. 408.3 Support and Arrangement of Busbars and Conductors.**

(A) Conductors and Busbars on a Switchboard, Switchgear, or Panelboard.



**(1) Location.** Conductors and busbars on a switchboard, switchgear, or panelboard shall be located to be free from physical damage and shall be held firmly in place.

**(2) Service Panelboards, Switchboards and Switchgear.** Barriers shall be placed in all service panelboards, switchboards, and switchgear such that no uninsulated,

ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations.

Service panelboards were added to the list that requires a barrier over energized busbar or terminals.

Even in the off position, a single main disconnecting means supplied by service entrance conductors has uninsulated supply side terminals remain energized and exposed, which is an electrical safety concern.

## **18. 422.16 Flexible Cords**

**(2) Built-in Dishwashers and Trash Compactors.**

Built-in dishwashers shall be permitted to be cord and-plug-connected with a flexible cord identified as suitable for the purpose in the installation instructions of the appliance manufacturer where all the following conditions are met:

- The cord is terminated with a grounding type attachment plug
- The length of the cord is 3-feet to 6.5-feet
- The receptacle is located to protect against physical damage to the flexible cord
- The receptacle for a built-in dishwasher shall be located in the space adjacent to the space occupied by the dishwasher
- The receptacle shall be accessible



The receptacle for a cord-and-plug-connected dishwasher cannot be located behind the dishwasher.

## **19. 440.9 Air-Conditioning and Refrigerating Equipment.**

**Grounding and Bonding.** Where multi-motor and combination-load equipment is installed outdoors on a roof, an equipment grounding conductor of the wire type shall be installed in outdoor portions of metallic raceway systems that use non-threaded fittings.



Concerns about separation of conduit when it is used as the equipment grounding conductor and is the sole ground-fault return path brought about a new requirement that outdoor portions of metallic raceway systems that use non-threaded fittings contain a wire-type equipment grounding conductor.

## **20. 514.3(B) Classified Locations.**

**Compressed Natural Gas, Liquefied Natural Gas, and Liquefied Petroleum Gas Areas.** Table 514.3(B)(2) shall be used to delineate and classify areas where CNG, LNG, compressed or liquefied hydrogen, LP-Gas, or combinations of these, are dispensed as motor vehicle fuels along with Class I or Class II liquids that are also dispensed as motor vehicle fuels. [30A:12.1]

Where CNG or LNG dispensers are installed beneath a canopy or enclosure, either the canopy or enclosure shall be designed to prevent accumulation or entrapment of ignitable vapors or all electrical equipment installed beneath the canopy or enclosure shall be suitable for Class I, Division 2 hazardous (classified) locations. [30A:12.4]



A new section 514.3(B)(3) was added with area classification information for compressed natural gas, liquefied natural gas, and liquefied petroleum gas fuel storage tanks.

The information was correlated with or extracted from NFPA 30A-2015, Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 58-2014, Liquefied Petroleum Gas Code, NFPA 58-2014, Liquefied Petroleum Gas Code, and NFPA 59-2012, Utility LP-Gas Plant Code.

## **21. 551 Part VI. Recreational Vehicle Parks**

**551. 75 Grounding. (RV Parks) (A) General.** All electrical equipment and installations in recreational vehicle parks shall be grounded as required by Article 250.



**(B) Grounding Electrode.** Power outlets or recreational vehicle site supply equipment, other than those used as service equipment, shall not be required to have a grounding electrode. An auxiliary grounding electrode(s) in accordance with 250.54 shall be permitted to be installed.

With this addition and the changes made in

Article 100 to the definition of structure, the inconsistent interpretations of the grounding electrode requirements for the electrical distribution in RV parks have been eradicated.

## **22. 555 Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities**

**555.1 Scope.** This article covers the installation of wiring and equipment in the areas comprising fixed or floating piers, wharves, docks, and other areas in marinas, boatyards, boat basins, boathouses, yacht clubs, boat condominiums, docking facilities associated with one-family dwellings, two-family dwellings, multifamily dwellings, and residential condominiums; any multiple docking facility or similar occupancies; and facilities that are used, or intended for use, for repair, berthing, launching, storage, or fueling of small craft and the moorage of floating buildings.

**555.3 Ground-Fault Protection.** The overcurrent protective devices that supply the marina, boatyards, and commercial and noncommercial docking facilities shall have ground-fault protection not exceeding 30 mA.

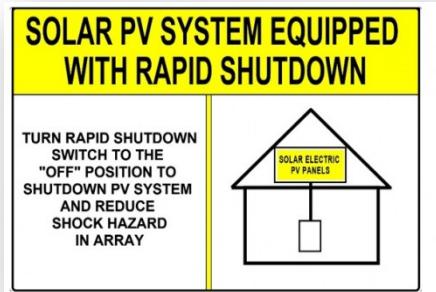
The change now provides the minimum acceptable level of safety to life and property at all public and private docks, boatyards, marinas and related facilities.

**NOTE:** Section 210.8(C) already requires ground-fault circuit-interrupter (GFCI) protection for outlets not exceeding 240 volts that supply boat hoists installed in dwelling unit locations.

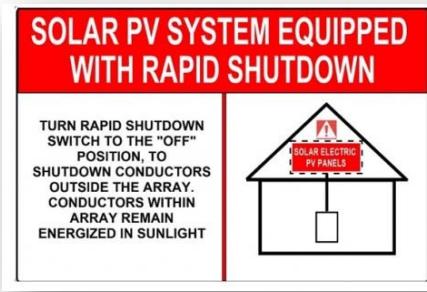


## **23.690. Identification of Power Sources.**

**(C) Buildings with Rapid Shutdown.** Buildings with PV systems shall have permanent labels as described in 690.56(C)(1) through (C)(3). (1) Rapid Shutdown Type. The type of PV system rapid shutdown shall be labeled:



Label for PV Systems that Shut Down the Array and the Conductors Leaving the Array



Label for PV Systems that Shut Down the Conductors Leaving the Array Only.

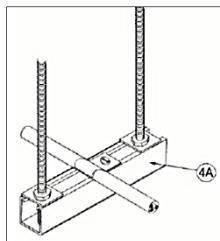
Both PV systems with a rapid shutdown and PV systems with no rapid shutdown require a detailed plan view diagram of the roof showing the location of each different PV system.

## **24.700.10 Wiring, Emergency System.**

**(D) Fire Protection.** Emergency systems shall meet the additional requirements in (D)(1) through (D)(3) in the following occupancies:

(1) Assembly occupancies for more than 1000 persons

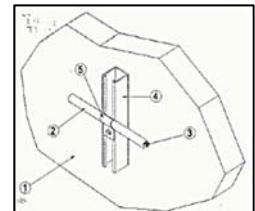
(2) Buildings above 75-feet in height with any of the following occupancy classes: assembly, educational, residential, detention and correctional, business, and mercantile



(3) Health care occupancies where persons are not capable of self-preservation

(4) Educational occupancies with more than 300 occupants

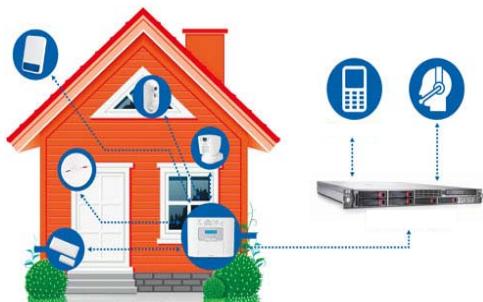
Fire protection for emergency system feeders (such as a listed electrical circuit protective system with a minimum 2-hour fire rating) only applied to emergency systems in assembly occupancies for more than 1000 persons or high-rise buildings exceeding 75-feet. Now, emergency systems in certain health care buildings, educational institutions with more than 300 occupants, and specified buildings over 75-feet also require that same level of protection.



## **25. Part IV Premises-Powered Broadband Communications Systems**

**840.160 Powering Circuits.** Communications cables, in addition to carrying the communications circuit, shall also be permitted to carry circuits for powering communications equipment. Where the power supplied over a communications cable to communications equipment is greater than 60 watts, communication cables and the power circuit shall comply with 725.144 where communications cables are used in place of Class 2 and Class 3 cables.

Power-over-ethernet (PoE) is widely used for simultaneously powering and communicating/signaling equipment and has become a preferred method of providing power to premises communications



equipment. Because the technology is rapidly changing industry standards are revised frequently and higher power levels are ultimately permitted. The additional heat generated by the increased current can push the cables beyond their rated temperature and cause long term degradation of the cable. The new limited-power (LP) cable designation shows that the cable has

been evaluated to carry the rated current when installed in areas with a high ambient temperature, within a conduit or raceway or when multiple cables are cinched together in large bundles.

Note that the “LP” is an additional designation similar to the circuit-integrity marking on Type CMP-CI, CMR-CI, and CM-CI cables. Type CMP-LP, CMR-LP and CM-LP are manufactured with larger copper current-carrying conductors to accommodate the higher ambient conditions. Cables with the LP suffix and a marked ampere rating are permitted to use the substitution hierarchy of Table 725.154 for the same cable type without the LP and amp markings.

When the power requirements exceed 60-watts the user is referred to see section 725.144 for Class 2, and Class 3 communication circuits and to new Table 725.144. The table shows copper conductor ampacity limits based on the wire gauge, the temperature rating of the conductor (60°C, 75°C or 90 °C) as well as the number of 4-pair cables in a bundle.

**725.144(B) (B) Use of Class 2-LP or Class 3-LP Cables to Transmit Power and Data.** Types CL<sub>3</sub>P-LP, CL<sub>2</sub>P-LP, CL<sub>3</sub>R-LP, CL<sub>2</sub>R-LP, CL<sub>3</sub>-LP, or CL<sub>2</sub>-LP shall be permitted to supply power to equipment at a current level up to the marked ampere limit located immediately following the suffix LP and shall be permitted to transmit data to the equipment.