

Changes to the 2017 National Electrical Code®

Chapter 5

Special Occupancies

500.2 Definitions Moved to Article 100

- Moved fourteen (14) definitions from Article 500.2 to Article 100.
- In the past definitions for Classified locations was placed in 500.2. These definitions were used in more than one article so they shall be placed in Article 100 as set by the NEC style manual
- The term “[as applied to Hazardous (Classified) Locations]” will be placed right after the term to indicate that it applies only to Hazardous (Classified) locations.

14 Definitions are located from 500.2 to Article 100

These are relocated Hazardous location definitions

- Combustible Dust
- Combustible Gas Detection System
- Control Drawing
- Dust-Ignitionproof
- Dusttight
- Hermetically Sealed
- Nonincendive Circuit
- Nonincendive Component
- Nonincendive Field Wiring
- Nonincendive Field Wiring Apparatus
- Oil Immersion
- Purges and Pressurized
- Unclassified Locations.

500.5(A) General

- Title of 500.5(A) “General” changed from “Classifications of Locations” as 500.5(A) applies to all of 500.5
- “Refrigerant machinery rooms” containing ammonia refrigeration may be classified as “unclassified” locations based on the use of gas detection and adequate ventilation. Revisions to 500.5(A) clarify that.
- “Adequate ventilation” defined as “not exceeding a concentration of 150 ppm (Parts Per Million) either continuous or initiated by a detection system.
- Ammonia refrigeration systems are covered by (ANSI/IIAR 2 and ANSI/ASHRAE 15). The NEC now matches these standards more closely.

500.5(A) General

The title of 500.5(A) was changed to “General” as it applies to all of 500.5

Refrigerant machinery rooms containing ammonia refrigeration may be classified as “unclassified” locations based on the use of gas detection and adequate ventilation (*concentration not exceeding 150 ppm*)

Class I, II, and III Locations and Groups			
Substances	Gas	Dust	Fibers/Flyings
Class	Class I [500.5(B)]	Class II [500.5(C)]	Class III [500.5(D)]
Division 1 (Normally Hazardous)	Flammable or combustible concentrations exist under normal operating conditions	Group E, Groups F and G Normally in air in ignitable concentrations	Where they are manufactured
Division 2 (Normally Hazardous)	Confined within closed systems and closed containers	Groups F and G Not normally in air in ignitable quantities	Where they are stored
Groups	A, B, C, and D NEC 500.6(A)	E, F, and G NEC 500.6(B)	No Groups
NEC Article	501	502	503

Table 500.8(D)(2) Deleted Class II Temperatures Ratings

- Table temperatures no longer needed as they are not used to set Class II temperature limitations.

Table 500.8(D)(2) Deleted

Previous **Table 500.8(D)(2) has been deleted** as the table is no longer applicable

Fixed ignition temperature limits referenced in the table are no longer used to evaluate Class II temperature limitations on equipment

Table 500.8(D)(2) - Class II Temperatures						
Class II Group	Equipment Not Subject to Overloading		Equipment (Such as Motors or Power Transformers) that may be overloaded			
			Normal Operation		Abnormal Operation	
Gas	°C	°F	°C	°F	°C	°F
E	200	392	200	392	200	392
F	200	392	150	302	200	392
G	165	329	120	248	165	329

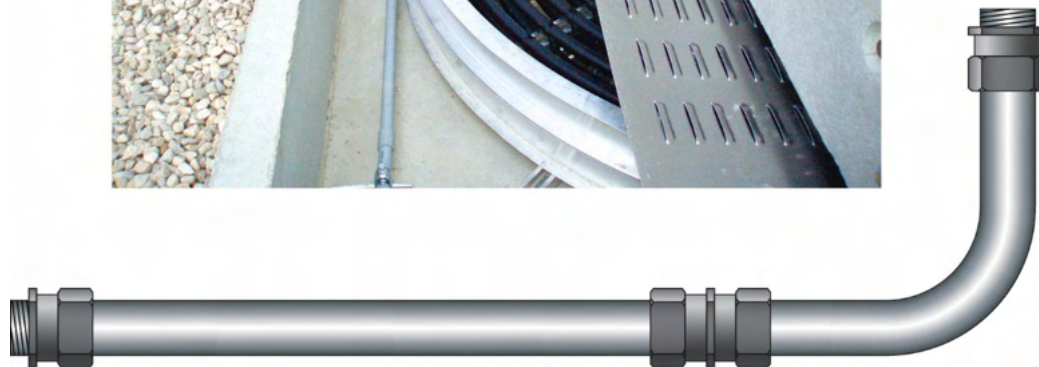
501.10(B)(1) Class I, Division 2 Wiring Methods

- Threadless fittings such as couplings and male adapters and also Cablebus have been added as acceptable fittings and wiring methods that can be used on Class 1 Division 2 locations.
- Class I, Division 2 locations are places where combustible gases or vapors are not normal present unless something else happens to release the gases or vapors.
- Threadless fittings already permitted to be installed in Class I, Division 2 locations on some cables.
- Cablebus is similar to ventilated cable tray that is allowed already in a Class I Division 2 location.

501.10(B)(1) Class I, Division 2

Rigid metal conduit (RMC) and intermediate metal conduit (IMC) with **listed threadless fittings** have been added to the allowable wiring methods in a Class I, Division 2 location

Cablebus also added to permitted wiring methods in a Class I, Division 2 location

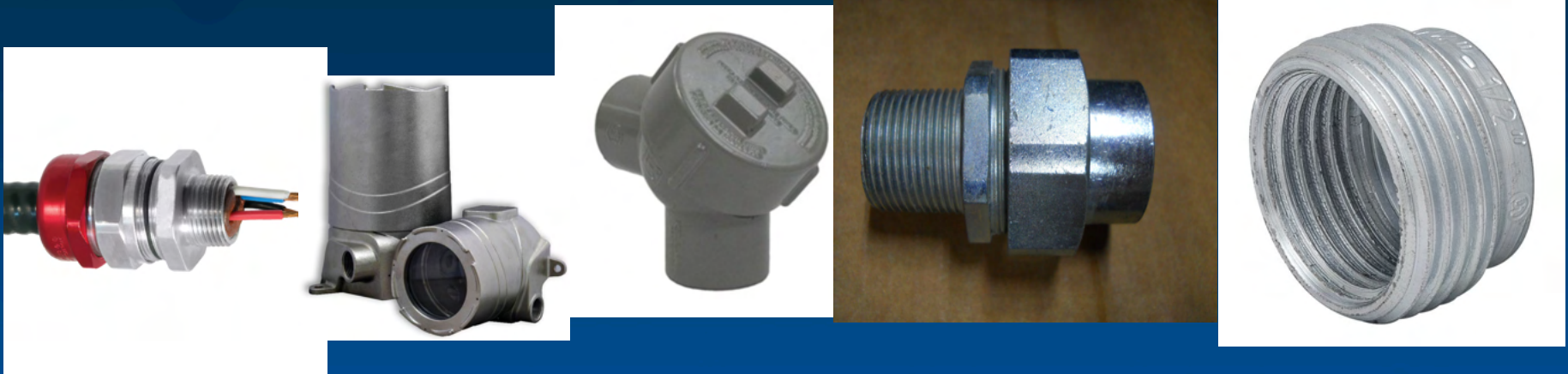


501.15(D)(1) Cable Seals - Class I, Division 1

- Fittings, Conduit Bodies not larger than the trade size of the connector shall be permitted to be installed between the seal and the enclosure. Only capped elbows, unions, reducers, couplings of the explosion-proof type shall be permitted.
- Seals can be up to 450 mm (18 in.) away and are so marked on the equipment.
- This allows the cable to be disconnected from the device without removing the sealing fitting.

501.15(D)(1) Cable Seals - Class I, Division 1

- Cable Seals must be within 18 inches of the enclosures, unless marked differently.
- Only items such as Capped Elbows, Explosionproof unions, Reducing Bushings, Elbows, and Couplings are allowed between the seal and the enclosure.



- These fittings cannot be larger than the trade size of the opening in the enclosure.

Table 511.3(C) and Table 511.3(D)

- 511.3 redone by adding tables for defining areas of classification of major and minor commercial repair garages
 - Table 511.3(C) Heavier-Than-Air Fuel Extent of Classified for Major and Minor repair garages
 - Example Overloading motors. Major
 - Example Jiffy Lube. Minor
 - Table 511.3 (D)) Lighter-Than-Air Fuel for Major repair garages.

Table 511.3(C) Extent of Classified Locations for Major and Minor Repair Garages with Heavier-Than-Air Fuel (Part 1 of 2)

Location	Class I		Extent of Classified Locations
	Division (Group D)	Zone (Group IIA)	
Repair garage, major (where Class I liquids or gaseous fuels are transferred or dispensed*)	1	1	Entire space within any pit, below-grade work area, or subfloor work area that is not ventilated
	2	2	Entire space within any pit, below-grade work area, or subfloor work area that is provided with ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 300 mm (12 in.) of floor level
	2	2	Up to 450 mm (18 in.) above floor level of the room, except as noted below, for entire floor area
	Unclassified	Unclassified	Up to 450 mm (18 in.) above floor level of the room where room is provided with ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 300 mm (12 in.) of floor level
	2	2	Within 0.9 m (3 ft.) of any fill or dispensing point, extending in all directions
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour or designed with positive air pressure or where effectively cut off by walls or partitions

* Includes draining of Class I liquids from vehicles.

Table 511.3(C) Extent of Classified Locations for Major and Minor Repair Garages with Heavier-Than-Air Fuel (Part 2 of 2)

Location	Class I		Extent of Classified Locations
	Division (Group D)	Zone (Group IIA)	
Repair garage, major (where Class I liquids or gaseous fuels are transferred or dispensed*)	2	2	Entire space within any pit, below-grade work area, or subfloor work area that is not ventilated
	2	2	Up to 450 mm (18 in.) above floor level, extending 0.9 m (3 ft) horizontally in all directions from opening to any pit, below-grade work area, or subfloor work area that is not ventilated
	Unclassified	Unclassified	Entire space within any pit, below-grade work area, or subfloor work area that is provided with ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 300 mm (12 in.) of floor level
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour or designed with positive air pressure or where effectively cut off by walls or partitions

* Includes draining of Class I liquids from vehicles.

Table 511.3(D) Extent of Classified Locations for Major and Minor Repair Garages with Lighter-Than-Air Fuel

Location	Class I		Extent of Classified Locations
	Division [†]	Zone [‡]	
Repair garage, major (where lighter-than-air gaseous fueled* vehicles are repaired or stored)	2	2	Within 450 mm (18 in) of ceiling, except as noted below
	Unclassified	Unclassified	Within 450 mm (18 in) of ceiling where ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 450 mm (18 in) of the highest point in the ceiling
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour or designed with positive air pressure or where effectively cut off by walls or partitions

* Includes fuels such as hydrogen and natural gas, but not LPG.

† For hydrogen (lighter than air) Group B, or natural gas Group D.

‡ For hydrogen (lighter than air) Group IIC or IIB+H₂, or natural gas Group IIA.





Safe & Sound
WALKER
Mufflers & Pipes

Alignment Done Here!

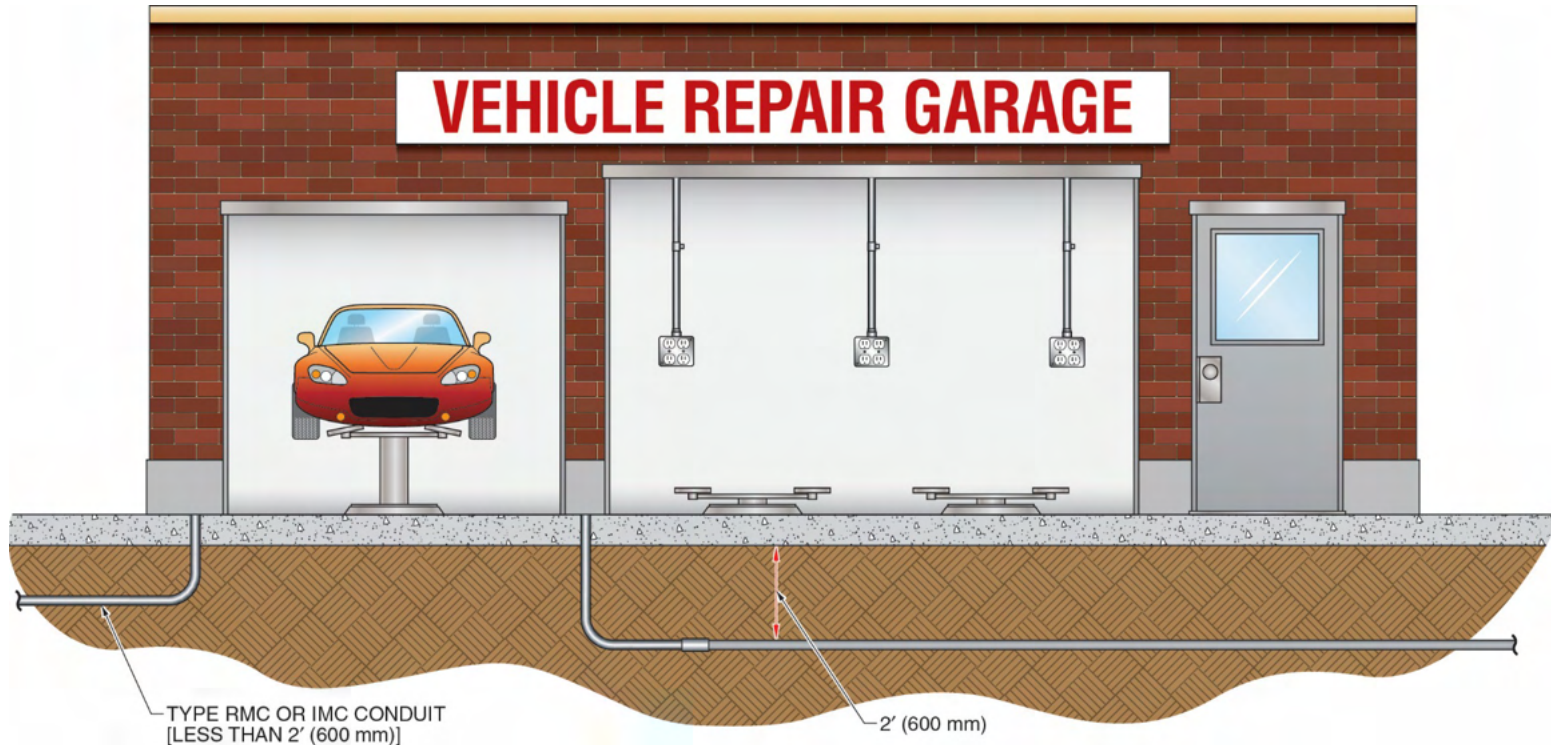


511.8 Underground Wiring - Commercial Garages, Repair and Storage

- General rule only allows Rigid Metal conduit ((RMC) or Intermediate Metal Conduit (IMC)
- If installed under 600 mn (2 ft), a new exception permits PVC conduit, RTRC conduit, and high density polyethylene (HDPE) conduit to be used . Must use RMC or IMC for last 2 ft horizontally till exposed above grade.

511.8 Underground Wiring

Underground wiring method for a commercial repair garage to be installed in threaded RMC conduit or threaded steel IMC conduit



Type PVC, RTRC, and HDPE conduit permitted to be used where buried under not less than 600 mm (2 ft) of cover

514.3(B)(3) Classification of Fuel Storage - Motor Fuel Dispensing Facilities

- Compressed natural gas, liquefied natural gas, and liquefied petroleum gas, Hydrogen fuel storage has been added
- Additional information was extracted from NFPA 30A (Code for Motor Fuel Dispensing Facilities and Repair Garages)
- Tanks are usually inside containment pits built of concrete. The tanks themselves usually have a double wall so if one is breached the other can contain it fuel.



NO SMOKING

FLAMMABLE

NATURAL GAS, COMPRESSED



05/23/2011 15:43



514.8 Ex. No. 2 Underground Wiring -Motor Fuel Dispensing Facilities

- PVC, RTRC and now High density polyethylene (HDPE) conduit was added to Ex. No. 2 as an permitted wiring method for underground installations for motor fuel dispensing facilities where buried under not less than 600 mm (2 ft) of cover and has RMC or IMC the last 2 feet Horizontally and till it emerges from grade.

514.8 Ex. No 2 Underground Wiring

Underground wiring for motor fuel dispensing facilities is required to be installed in threaded RMC or threaded steel IMC



High density polyethylene (HDPE) conduit (*along with Type PVC and RTRC conduit*) was added as an acceptable wiring method for underground installations for motor fuel dispensing facilities where buried under not less than 600 mm (2 ft) of cover



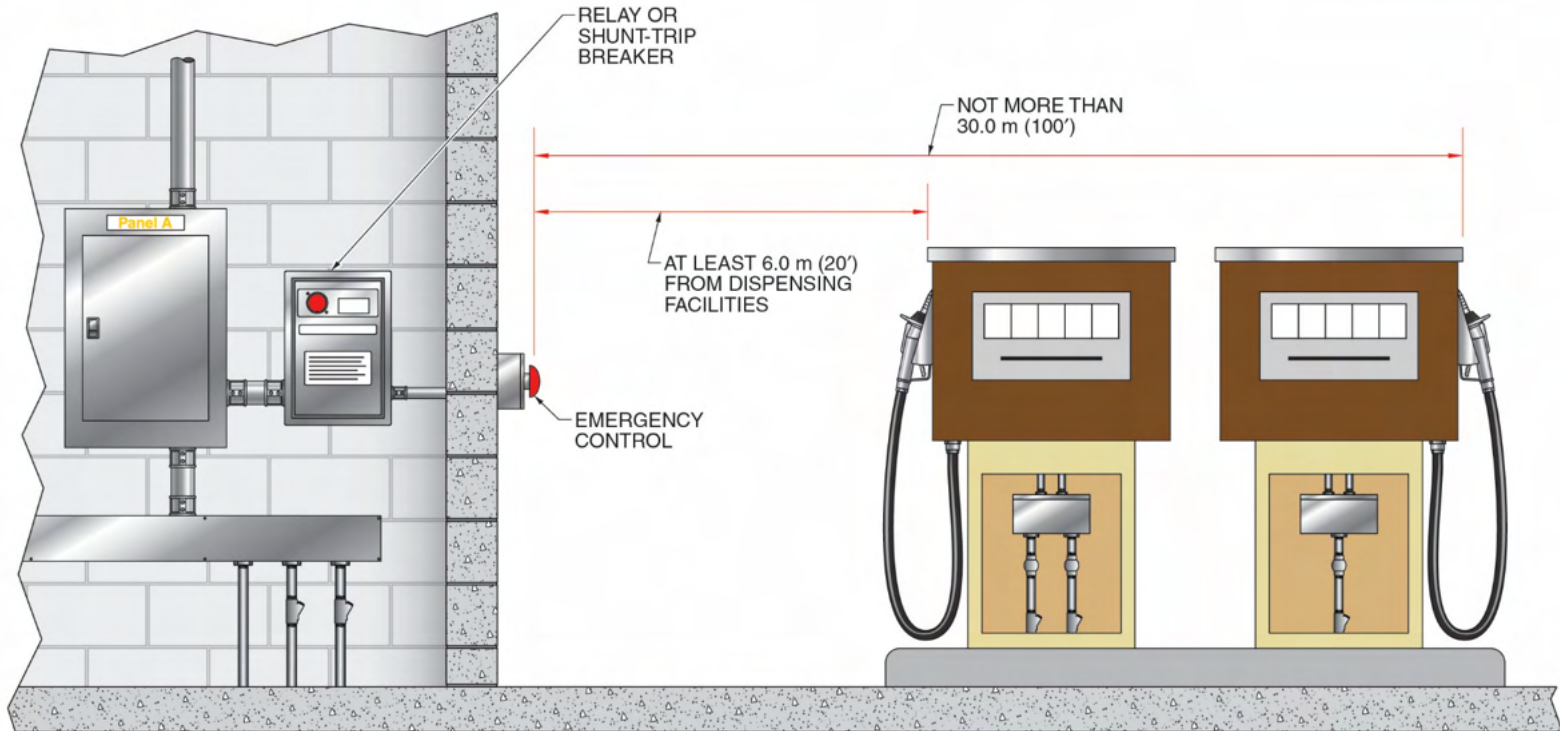
514.11 Circuit Disconnects – Motor Fuel Dispensing Facilities

- Follows along with NFPA 30A
- Is for both Attendant and Un-attendant Fuel dispensing facilities.
- Must have one or more clearly identified emergency shutoff devices or disconnecting means.
- Such shutoff devices or disconnects shall be not less than 6 m (20 feet) or more than 30 m (100 feet) to be installed in approved locations.
- This is for all the dispensers. Might require two different locations for the shut down devices or disconnects. Depending on distance of pumps to disconnects or shut down device.

514.11 Emergency Controls for Fuel Dispensers

Emergency controls shall:

- Be provided at approved locations
- Be located not less than 6.0 m (20 ft) or more than 30 m (100 ft) from the dispenser(s)
- Be clearly identified
- Remove all associated power (*including low voltage*)



Applies to both Attended and Unattended motor fuel dispensing facilities



EMERGENCY
SHUT-OFF
SWITCH

NOTICE
THIS AREA IS
UNDER 24
HOUR VIDEO
SURVEILLANCE



Article 516

(Revised Entire Article)

- Article covers processes such as printing, spraying and coating using Flammable or Combustible Materials
- Article 516 was revised to make it clearer to use and understand.
- Four individual parts were added to the article
 - Part I. General
 - Part II. Open Containers
 - Part III. Spray Application Processes
 - Part IV. Spray Application Operations in Membrane Enclosures
- Requirements now match NFPA 33 (Standard for Spray Application Using Flammable and Combustible Materials) and NFPA 34 (Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids)

Article 516 Entire Article Revised

Article 516 Spray Application, Dipping, Coating, and Printing Processes Using Flammable or Combustible Materials

Article 516 was extensively revised for clarity and to align with NFPA 33 *Standard for Spray Application Using Flammable and Combustible Materials* and NFPA 34 *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*

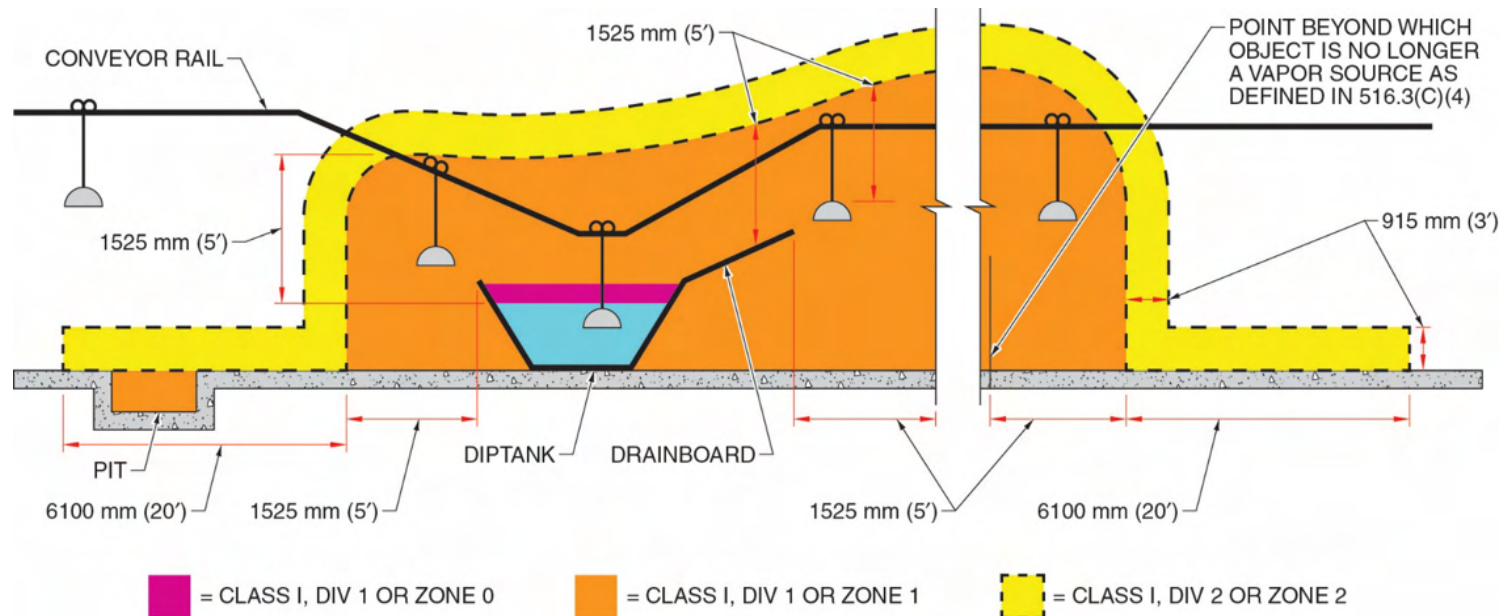


Figure 516.29(a) Electrical Area Classification for Open Dipping and Coating Processes Without Vapor Containment or Ventilation

517.2 Definitions: Governing Body - Health Care Facilities

- Definition of “Governing Body” added to Article 517
- 7 different locations in Article 517 Term “governing body” appears
- Definition was extracted from NFPA 99 from “[99: 3.3.62]”
- New definition gives clear instructions who is responsible for making decisions concerning the use of the facilities of a Health Care buildings.

517.2 Definitions (Health Care Facilities)

Governing Body. The person or persons who have the overall legal responsibility for the operation of a health care facility



517.2 Definitions: Health Care Facilities

- Definition of “Health Care Facility” now include “mobile enclosures”
- Definition in the previous edition of the Code had examples of what were health care facilities, these are now found in an informational note below the revised definition
- Revised definition is extracted material from NFPA 99 (Healthcare Facilities Code)
- Health care facility can be mobile trucks and are not limited to a traditional “brick and mortar” constructed building

517.2 Definitions (Health Care Facilities)

Health Care Facilities. Buildings, portions of buildings, or mobile enclosures in which human medical, dental, psychiatric, nursing, obstetrical, or surgical care are provided [99: 3.3.67]



Informational Note: Examples of health care facilities include, but are not limited to, hospitals, nursing homes, limited care facilities, clinics, medical and dental offices, and ambulatory care centers, whether permanent or movable



Health Care
on the *Go*



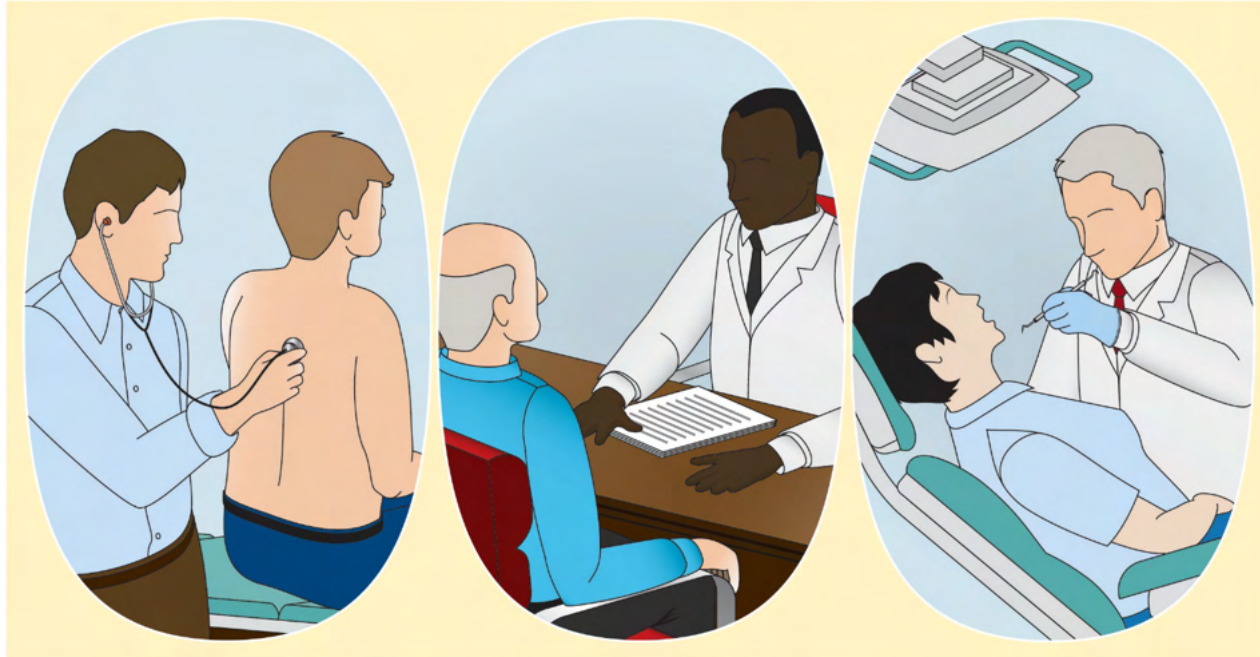
O
P
E
N

517.2 Definitions: Medical Office (Dental Office)

- A new definition for “Medical Office (Dental Office)” was added at 517.2
- New definition will provide needed clarity when determining health care facility requirements such as branch circuit requirements at patient bed locations
- Medical or dental office do not have overnight stays for patients or 24-hour operation facilities.
- In minor treatment or procedures under the continuous supervision of a medical or dental professional with the use of sedation or local anesthesia is involved would be involved at a medical or dental office

517.2 Definitions (Health Care Facilities)

Medical Office (Dental Office). A building or part thereof in which the following occur:



- (1) Examinations and minor treatments or procedures are performed under the continuous supervision of a medical or dental professional;
- (2) Only sedation or local anesthesia is involved and treatment or procedures do not render the patient incapable of self-preservation under emergency conditions; and
- (3) Overnight stays for patients or 24-hour operation are not provided. [99: 3.3.98]

517.2 Definitions: Patient Care Space - Health Care Facilities

- “Patient Care Space” revisions will include four NFPA 99 numbered categories for:
 - Critical Care (Category 1) Space
 - General Care (Category 2) Space
 - Basic Care (Category 3) Space
 - Support (Category 4) Space
- NFPA 99 references were added after each description and informational note
- Examples of each of the different categories was added to the informational notes.
- Revised definitions and informational notes will help clean up the meaning and use of these spaces

517.2 Definitions (Health Care Facilities)

Definition for “**Patient Care Space**” was revised for clarity and to align with definitions in NFPA 99

Basic Care (Category 3) Space:

- Examination or treatment rooms in clinics
- Medical and dental offices
- Nursing homes
- Limited care facilities

Critical Care (Category 1) Space:

- Special care unit patient rooms used for critical care
- Intensive care
- Special care treatment rooms
 - Angiography laboratories
 - Cardiac catheterization labs
 - Delivery rooms
 - Operating rooms
 - Post-anesthesia care units
 - Trauma rooms

General Care (Category 2) Space:

- Inpatient bedrooms
- Dialysis rooms
- In vitro fertilization rooms
- Procedural rooms
- Similar rooms

Support (Category 4) Space:

- Anesthesia work rooms
- Sterile supply
- Laboratories
- Morgues
- Waiting rooms
- Utility rooms
- Lounges

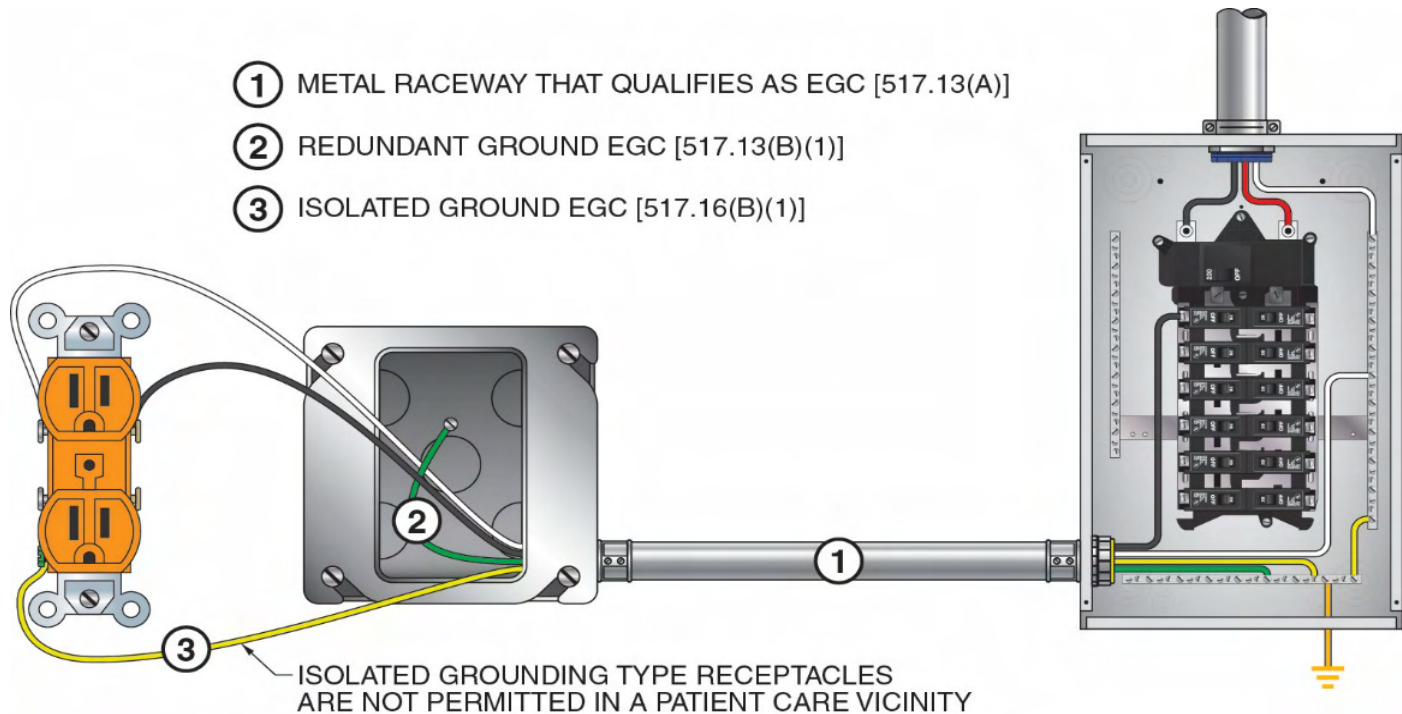
517.16 Use of Isolated Ground Receptacles

- 516.16 divided into two subdivisions for the non-use of isolated ground receptacles:
 - (A) Inside of a Patient Care Vicinity
 - Cannot be installed in this location.
 - (B) Outside of a Patient Care Vicinity
 - Can be used if meeting grounding requirements.
 - Must have 3 grounding paths
 - ✓ 1. Green Wire with Yellow strip
 - ✓ 2. Metal Conduit.
 - ✓ 3. Redundant ground path for the conduit. As needed in 250.146 (D).



517.16 Use of Isolated Ground Receptacles

New provisions were added to 517.16 pertaining to the proper installation of isolated ground receptacles located **outside of a patient care vicinity**



The prohibition of isolated ground receptacle inside a patient care vicinity are addressed at **517.16(A)** and isolated ground receptacles installed outside a patient care vicinity are addressed at **517.16(B)**

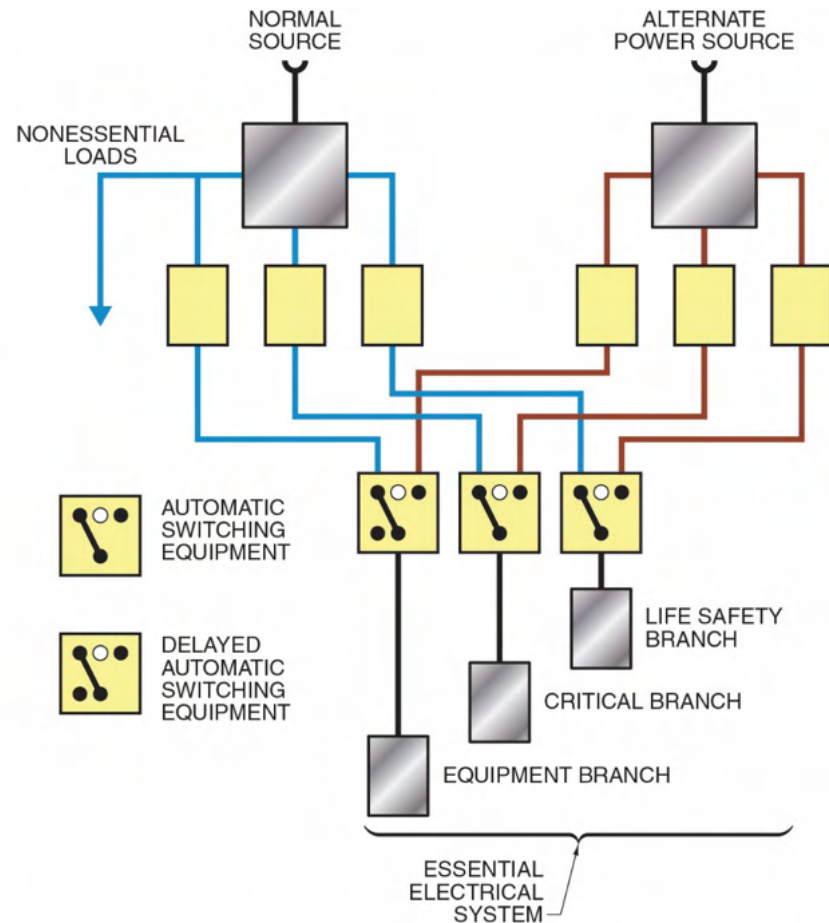
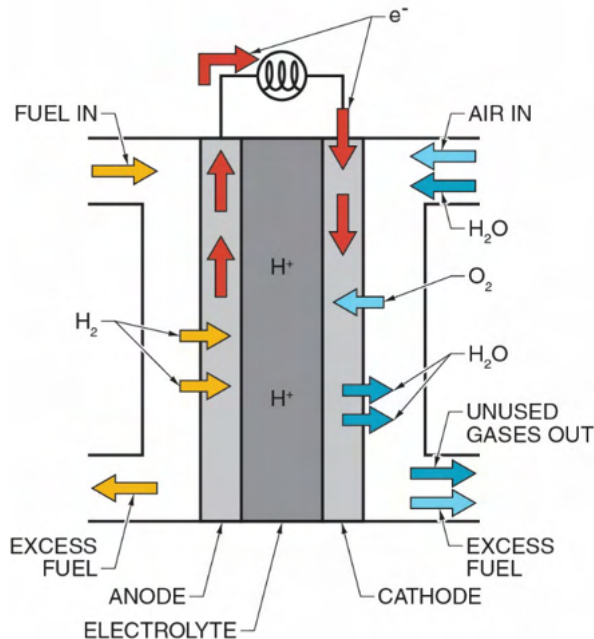
517.30 Types of Power Sources for Essential Electrical System - Health Care Facilities

- Requirements for two independent sources of power, one which is normal power and the other which is alternative source when the normal power source is interrupted. Was relocated to 517.30
- Fuel cell systems + 1 that will carry the demand load shall now be permitted to be used as the alternative power source.
- A connection for a portable diesel generator to supply safety and critical portions of the distribution systems shall also be installed.

517.30(B) Sources of Power Essential Electrical System (Hospital)

Requirements for two independent sources of power and an alternate source of power for the essential electrical system for hospitals and other health care facilities were revised and relocated to 517.30 (*was 517.35*)

Fuel cell systems will now be permitted to serve as the alternate source for all or part of an essential electrical system





← HYDROGEN VENT

VENT

VENT

VENT

CLEAN POWER HYDROGEN FUEL CELL

Powered by HYDROGENICS



517.34(B) Switching on Critical Branch

- Is now permitted to allow the control of task illumination on the critical branch of the essential electrical system.
- Minimum lighting required to carry out necessary tasks in the described areas, including safe access to supplies and equipment, and access to exits”
- Lighting is provided in part for Critical task for the comfort and convenience of the patient
- The patient at his or her own discretion shall have control of the illumination.

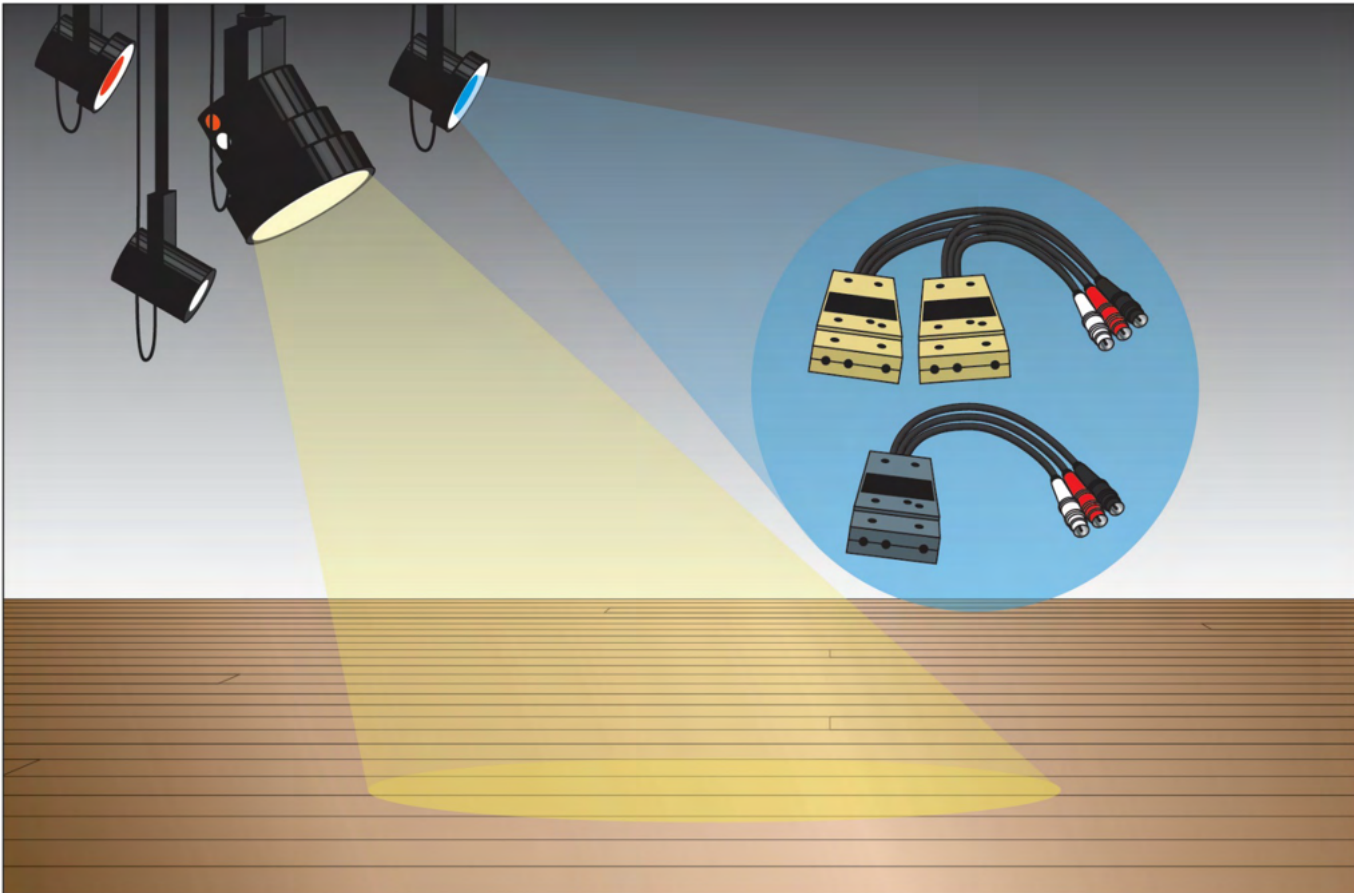


520.2 Definition: Adapter

- Article 520 deals with Theaters, Audience Areas of Motion Picture and Television Studios, Performance Areas, and Similar Locations
- The term “Adapter” was added and defined to address missed use of this term in Article 520
- Multiple devices connected together or to a single source used often by the entertainment industry.
- Two-fer” and other single- and multiple-circuit outlet devices have performance standards to be used as adapters
- Portable extension cords have sometimes been misapplied in the term Adapter by the entertainment industry
- New definition needed to correct field misapplication of adapters

520.2 Definitions: Adapter

Adapter. A device used to adapt a circuit from one configuration of an attachment plug or receptacle to another configuration with the same current rating



520.2 Definitions: Stage Switchboard, Portable

- “Stage Switchboard, Portable” definition was added.
- The phrase “permanently installed” was added to the existing definition of “Stage Switchboard”
- Portable stage switchboard clarifies that these devices can only feed stage equipment.
- Permanent stage switchboard can feed both stage and non-stage equipment
- Switchboard” in the entertainment industry are “dimmer rack” or a “relay rack/panel” depending on its function

520.2 Definitions: Stage Switchboard

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.



Stage Switchboard, Portable. A portable rack or pack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone that are used to feed stage equipment.

520.2 Definitions: Stage Switchboard, Portable

Theaters, Audience Areas of Motion Picture and Television Studios, Performance Areas, and Similar Locations



525.23(D) GFCI Protection Carnivals, Circuses, Fairs, and Similar Events

- Cords with boxes and GFCI receptacles must be listed, labeled, and identification for portable use when said GFCI protection is provided through the use of GFCI receptacles.
- Portable GFCIs are plug-in type GFCIs that shall be installed at the supply end of the cords.
- These are common at carnivals, fairs, where flexible cords are used.
- Temporary GFCI installation on construction sites has resulted in a number of documented fatalities, which resulted in a comparable restriction at 590.6(A)(2)

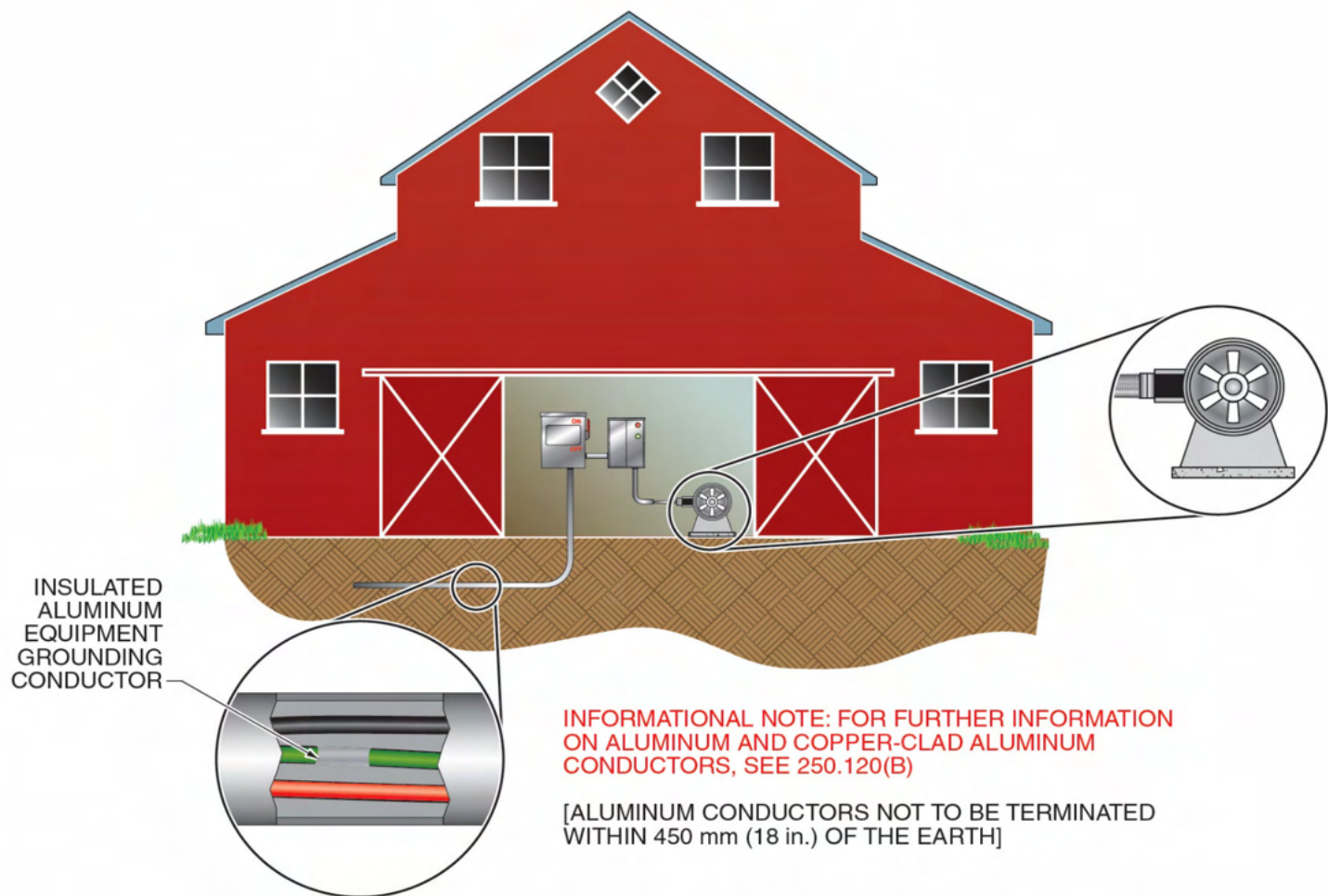


547.5(F) Separate Equipment Grounding Conductor for Agricultural Buildings

- All underground separate equipment grounding conductor (EGC) for an underground installation on agricultural building must be insulated.
- The allowance of a “covered” conductor for underground applications at agricultural buildings was removed.
- “Covered conductor” are a conductor with a cover that has not been reconized by the NEC as being an insulating material.
- There has been not evaluation or testing on the material is it is only called Covered.

547.5(F) Separate EGC (Agricultural Buildings)

An insulated ~~or covered~~ aluminum or copper equipment grounding conductor is now permitted for underground agricultural building installations



550.2 Definitions: Manufactured Home

- Manufactured home definition was revised for consistency found in NFPA 501 (Standard on Manufactured Housing)
- Park trailers are not considered to be Manufactured Homes. Park trailers are intended for use as seasonal use only.
- All manufactured and prefabricated homes since 1976, the Federal Government [Department of Housing and Urban Development (HUD)] has regulated the construction.

550.2 Definitions: Manufactured Home

Manufactured Home. A structure, transportable in one or more sections, that, which in the traveling mode is 2.4 m (8 body-ft) or more in width or 12.2 m (40 body-ft) or more in length, or when erected on site, is 29.77 m² (320 ft²) or more and that is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation, whether or not connected to the utilities, and includes plumbing, heating, air conditioning, and electrical systems contained when connected therein. The term manufactured home includes any structure that meets all the provisions requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the regulatory agency, and except that such term does not include any self-propelled recreational vehicle. Calculations used to determine the number of square meters (square feet) in a structure are based on the structure's exterior dimensions, measured at the largest horizontal projections when erected on site. These dimensions and include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows [501: 1.2.14].

550.2 Definitions: Manufactured Home

For the purpose of this Code and unless otherwise indicated, the term mobile home includes manufactured homes and excludes park trailers defined in 552.4.



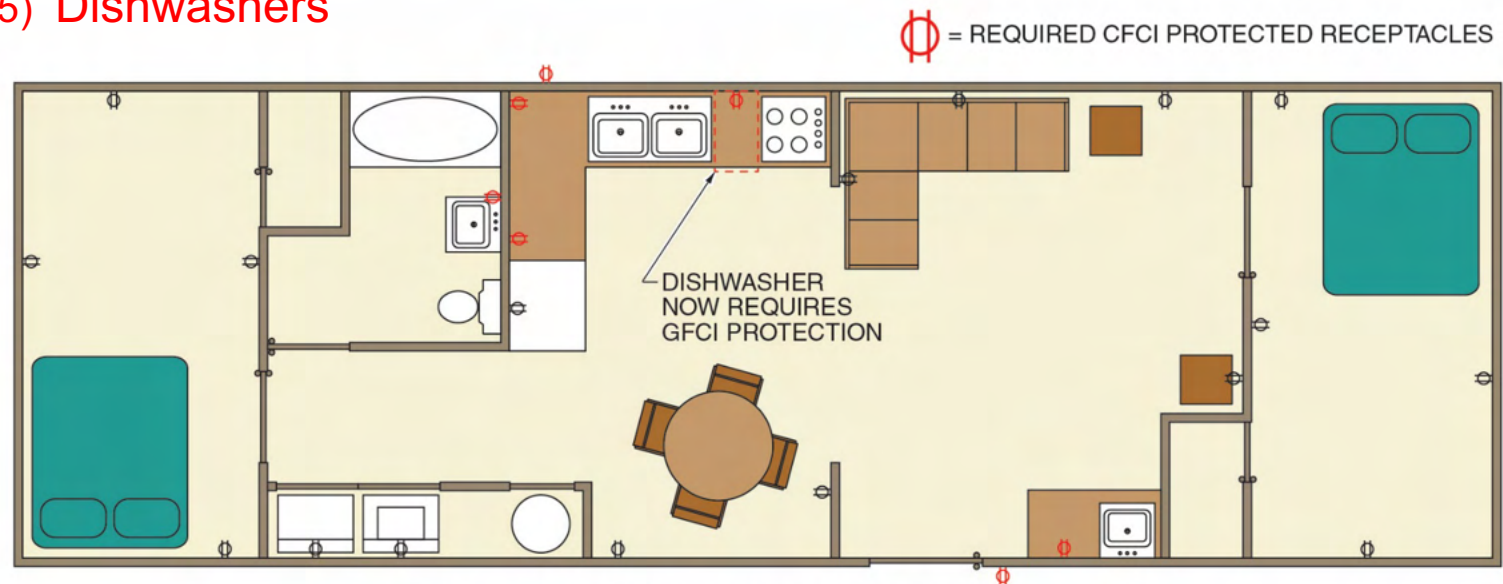
550.13(B) GFCI Protection for Receptacle Outlets at Mobile Homes

- GFCI coverage for all sinks, dishwashers and other locations similarly found at 210.8(A) now applies for protection of mobile and manufactured homes.
- GFCI provisions for outdoor receptacle outlets to include all outdoor receptacle outlet including those outlets located in compartments accessible from outside of Mobile Homes.
- GFCI protection was allowed to be done by the use of feeder protection. The use of GFCI on feeders has been removed.
- Mobile and manufactured homes have not always kept pace with the same GFCI requirements for a conventional dwelling unit

550.13(B) GFCI Protection Required for Mobile and Manufactured Homes

All 125-volt, single-phase, 15- and 20-ampere receptacle outlets installed in the following locations shall be provided with GFCI protection:

- (1) Outdoors, **including** compartments accessible from outside the unit
- (2) Bathrooms (including receptacles in luminaires)
- (3) Kitchens, where receptacles are installed to serve countertop surfaces
- (4) Sinks, where receptacles are installed within 1.8 m (6 ft) of the **outside edge** of a sink (*any sink*)
- (5) Dishwashers



OVERHEAD CUT-AWAY VIEW OF MOBILE OR MANUFACTURED HOME

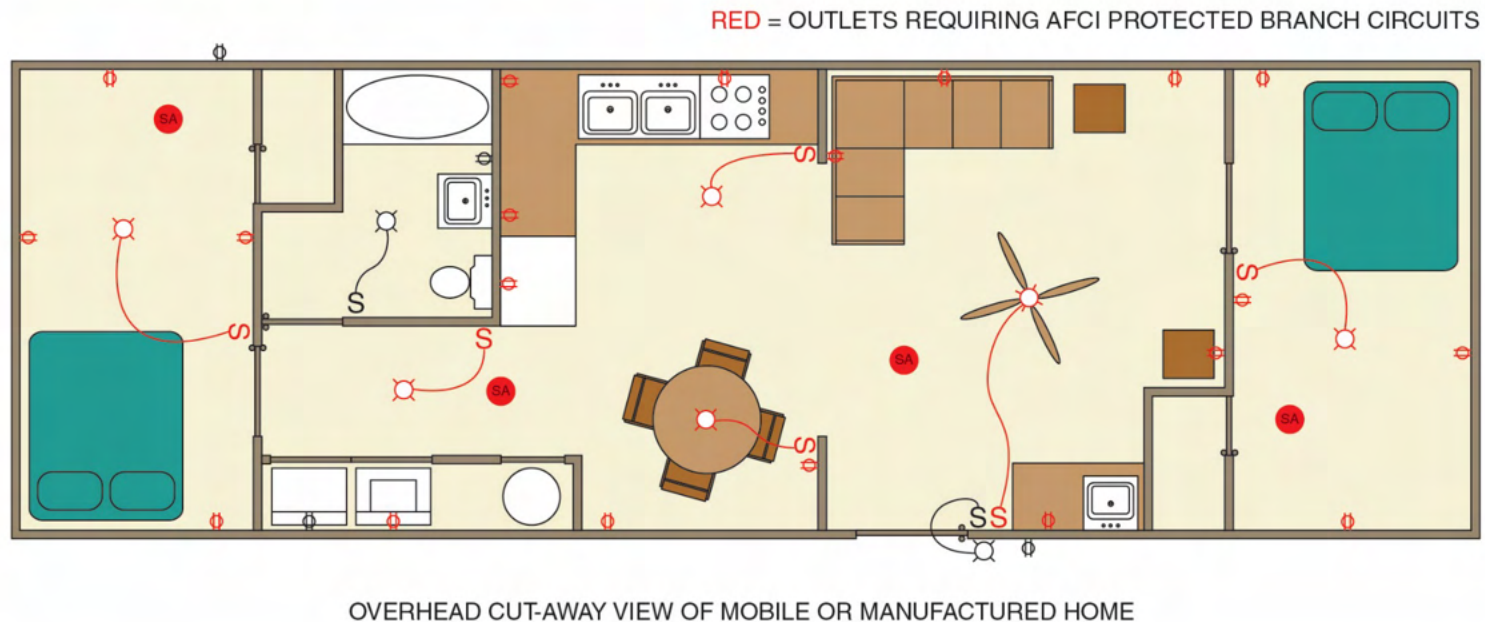


550.25(B) AFCI Protection at Mobile and Manufactured Homes

- AFCI protection for Mobile and Manufactured homes shall meet the same requirements as found in 210.12
- This will help keep conventional dwellings, Mobile and Manufactures homes to keep pace with each other for AFCI protection..
- All dwelling types shall have the same equal protections in regards to AFCI.
- With 210.12 being used in the test, any changes to AFCI protection for conventional dwelling units will have the same effect at mobile and manufactured homes

550.25 AFCI Protection at Mobile and Manufactured Homes

AFCI protection at mobile and manufactured homes was revised by eliminating the specific “laundry list” of rooms and areas requiring AFCI protection at mobile and manufactured homes and simply requiring compliance with 210.12



All 120-volt branch circuits that supply 15- and 20-ampere outlets **shall comply with 210.12**



551.2 Definitions: Recreational Vehicle Park

- Recreational Vehicle Park” was redone to correlate with the same definition in NFPA 1194 (Standard for Recreational Vehicle Parks and Campgrounds)
- The minimum construction requirements for safety and health for occupants using facilities supplied by RV parks is found in NFPA 1194.
- Made the definition less specific and limiting and more encompassing such as the definition of “Mobile Home Park” at 550.2
- RV sales lots and storage areas for RVs are not included in this definition.

551.2 Definition: RV Park

Recreational Vehicle Park. Any parcel or tract of land under the control of any person, organization, or governmental entity wherein two or more RV, recreational park trailer, and/or other camping sites are offered for use by the public or members of an organization for overnight stays



The definition of “Recreational Vehicle Park” was revised to make the definition consistent with that in NFPA 1194 (*Standard for RV Parks and Campgrounds*)

551.71 Type of Receptacles Provided for RV Parks

- 50-ampere, 125/250-volt receptacles required at RV Sites has increased from 20 percent to 40 percent for new recreational vehicle sites
- Over 1/3 of new RV production currently are equipped with 50-ampere power supplies.
- The need for larger amount of current will increase in the coming years.
- The use of Adapter cords should not be an option that would allow a 50 amp cords to be connected to a 30 amp supply.

551.71 Type of Receptacles Provided for RV Parks (cont.)

- RV site electrical equipment that have GFCI Receptacles are not required to be weather or tamper resistant in accordance with 406.9 and 406.12
- Electrical equipment listed for RV parks are NEMA 3R rated, weather resistant rated equipment and receptacle requirements of 406.9 are not needed
- RV site are not dwellings, so the tamper resistant receptacle requirements of 406.12 is not necessary

551.71 Type Receptacles Provided at RV Parks

Every RV site (with electrical power provided) must be equipped with a certain number and type of receptacles [see 551.71(A) through (F)]



20-A, 125-V,
2-POLE, 3-WIRE,
GROUNDING TYPE



30-A, 125-V,
2-POLE, 3-WIRE,
GROUNDING TYPE



50-A, 125/250-V,
3-POLE, 4-WIRE,
GROUNDING TYPE

551.71 has been broken into **six separate first level subdivisions with titles**

The number of RV sites required to be equipped with 50-ampere, 125/250-volt receptacles has increased from 20 percent to **40 percent for all new RV sites**

GFCI devices used in RV site electrical equipment **not required to be weather or tamper resistant** in accordance with 406.9 and 406.12

551.71 Type of Receptacles Provided for RV Parks (*cont.*)





551.73(A) Calculated Load for RV Parks.

- 50-ampere, 208Y/120 or 120/240-volt RV Site minimum load increased from 9600 volt-amperes to 12,000 volt-amperes per site
- 240 volts at 40 amps provided the 9600 VA, , 12,000 VA is based at 240 volts at 50 amps.
- As RV's become larger the need for sites to provide more VA per site also increases.
- Larger service and feeder conductors also will be required to be increased to serve the RV sites.

551.73(A) Calculated Load for RV Parks

The calculated load for electrical services and feeders at RV parks shall be calculated on the basis of not less than 12,000 volt-amperes per RV site equipped with 50-ampere, 208Y/120 or 120/240-volt supply facilities.

*Calculated Load for RV Park with
28 RV Sites All with 50 A, 240 V Outlets*

$$~~9600~~ 12,000 \text{ VA} \times 28 = 336,000 \text{ VA}$$

$$336,000 \text{ VA} \times (.42) = 141,120 \text{ VA}$$

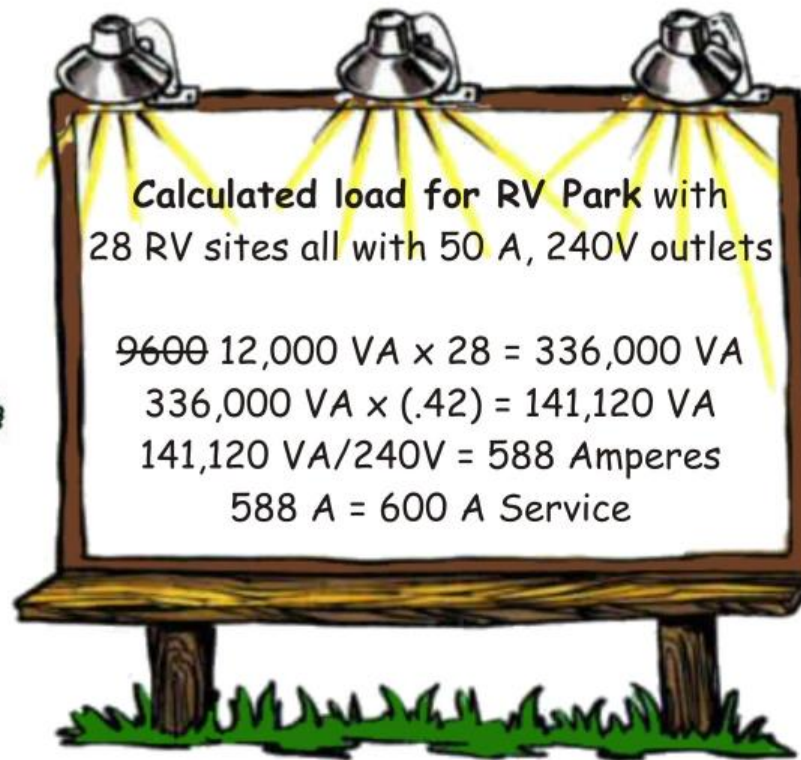
$$141,120 \text{ VA} / 240 \text{ V} = 588 \text{ AMPERES}$$

$$588 \text{ A} = 600 \text{ A SERVICE}$$

551.73(A) Calculated Load for RV Parks



The calculated load for electrical services and feeders at RV parks shall be calculated on the basis of not less than **12,000 volt-amperes** per RV site equipped with 50-ampere, 208Y/120 or 120/240-volt supply facilities.



Copyright © IAEI 2017

551.75(B) Grounding Electrode Requirements at RV Parks

- RV pedestals are equipment and not a Structure or building. Since they are equipment they only require an equipment grounding conductors and not an grounding electrode and grounding electrode conductor.
- Is in direct collation with the revised definitions for a “building” and a “structure” as found in Article 100
- A added information on the definition of a building or structure makes it very clear that the RV pedestal is equipment and does not need an electrode.



Article 555 Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities

- Name change of Article Title “Marinas and Boatyards” to “Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities”
- Revised 555.1 to make sure that dwelling unit docking facilities are included in this article.
- As written, the rules in Article 555 would not apply to residential commercial, and non-commercial boat docking facilities.
- Article 555 now applies to all wiring, equipment, and electrical systems installed at boat docking facilities, no matter its location



555.3 GFP at Marinas, Boatyards and Commercial/Noncommercial Docking Facilities

- For marinas, and boatyards, ground-fault protection (GFP) is required for commercial and noncommercial docking facilities cannot exceed 30 mA which was revised down from 100 mA.
- All supply overcurrent protective devices, require GFP protection.
- GFCI protection in each individual branch or feeder, was dropped, as this 30 mA GFP protection is required in all supply OCPDs
- All 15- and 20-ampere, single-phase, 125-volt receptacles still require GFCI protection. [see 555.19(B)(1)]

555.3 Ground-Fault Protection

The **main** overcurrent protective devices that supply the marina, **boatyards, and commercial and noncommercial docking facilities** shall have ground fault protection not exceeding **30 mA**



GFP protection required for OCPDs for marinas, and now boatyards, and commercial and noncommercial docking facilities as well reduced to a maximum of 30 mA rather than 100 mA

This GFP protection is required on all supply OCPDs (*not necessarily the main OCPD*)



555.19(B)(1) GFCI Protection for Personnel

- All receptacles regardless of use is required to be GFCI protected. The term “where portable electrical hand tools, electrical diagnostic equipment, or portable lighting equipment are to be used” was removed.
- Was told Difficult for AHJ to determine which receptacles will used for “portable electrical hand tools, electrical diagnostic equipment, or portable lighting equipment” and which receptacles will not be.

555.19(B) GFCI Protection for Personnel

GFCI protection required for all 125-volt, single-phase, 15- and 20-ampere receptacles installed outdoors, in boathouses, and in buildings or structures used for storage, maintenance, or repair regardless of the intended use



The term, “where portable electrical hand tools, electrical diagnostic equipment, or portable lighting equipment are to be used” was deleted

The removal of this portable electrical hand tool, etc. conditional language will aid the AHJ in enforcement of the GFCI requirements at these locations

555.24 Signage - Marinas, Boatyards and Commercial/Noncommercial Docking Facilities

- Precautionary signage related to electric shock hazard in water around marinas and boatyards is now required to be posted.
- Provides information that shock hazard to people using the water area near docks and marinas.
- Signage must be seen clearly from all approaches to a marina or boatyard
 - and comply with 110.21(B)(1)
- The signs shall state:

WARNING — POTENTIAL SHOCK HAZARD — ELECTRICAL CURRENTS MAY BE PRESENT IN THE WATER

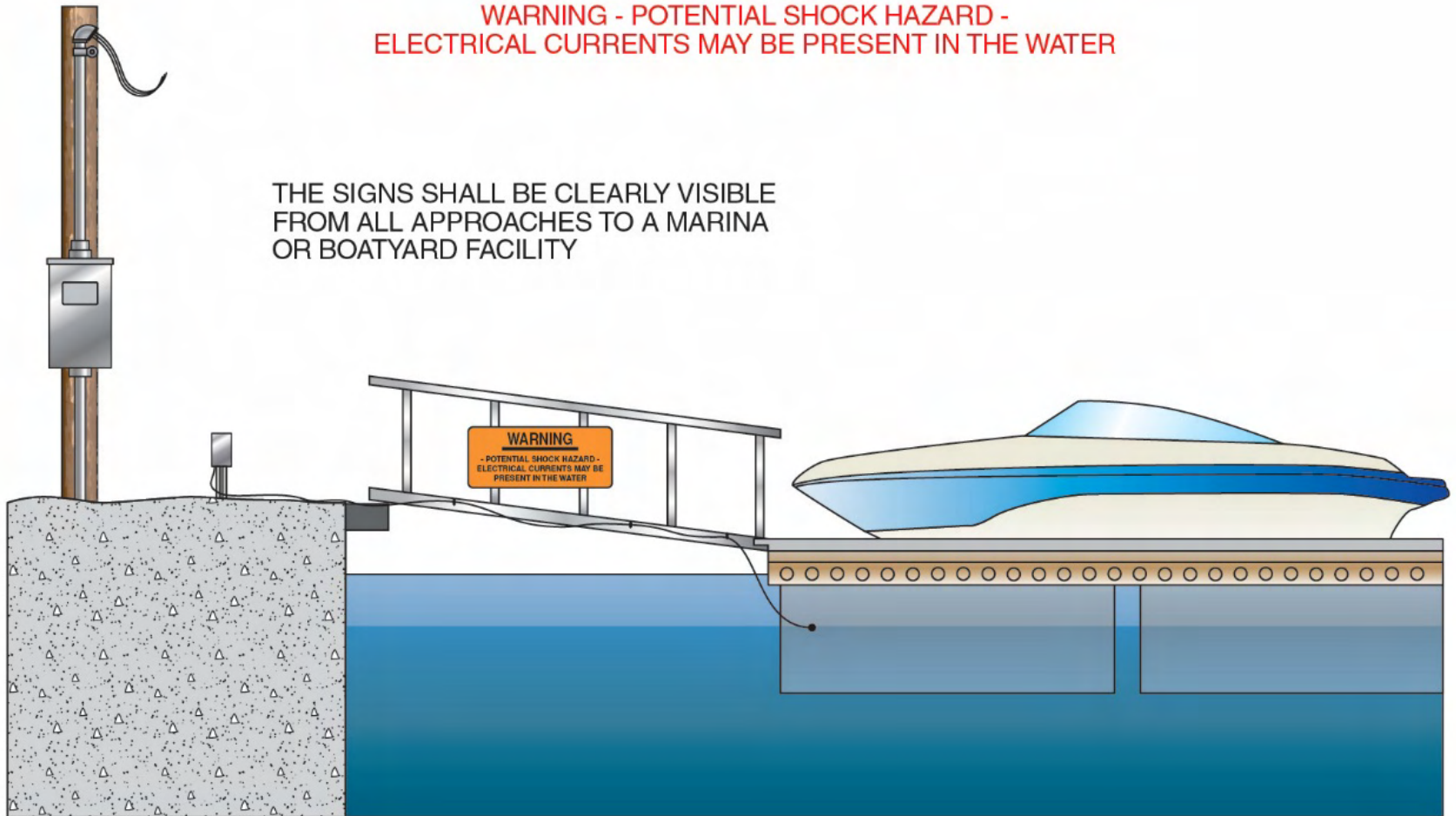
- Due to increase in people getting shocked and even electrocuted a warning must be provided at all dock and marinas.

555.24 Signage at Marinas, Boatyards, etc.

New requirements added for permanent safety signs to be installed to give notice of electrical shock hazard risks to persons using or swimming near a boat dock or marina

WARNING - POTENTIAL SHOCK HAZARD -
ELECTRICAL CURRENTS MAY BE PRESENT IN THE WATER

THE SIGNS SHALL BE CLEARLY VISIBLE
FROM ALL APPROACHES TO A MARINA
OR BOATYARD FACILITY



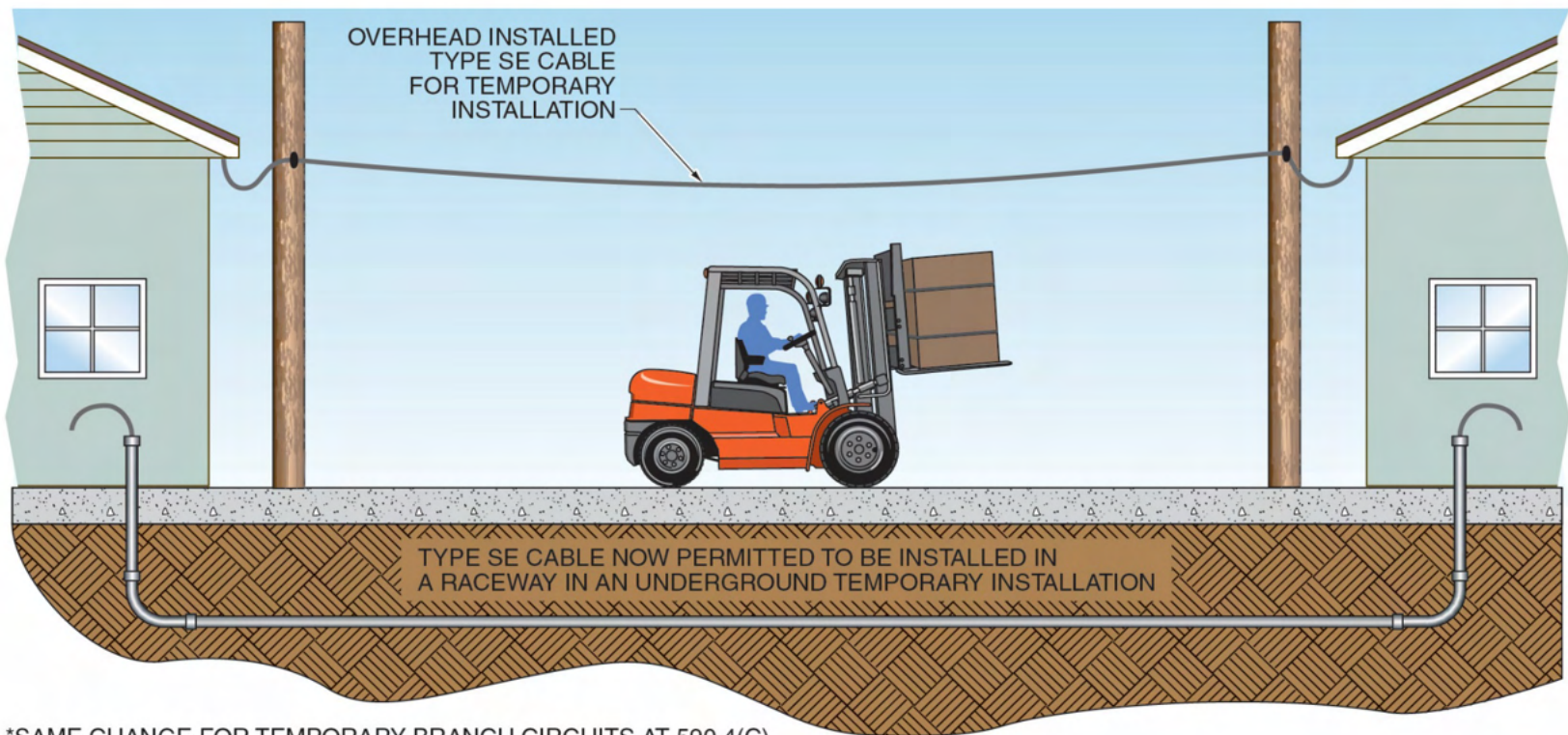


590.4(B) Feeders for Temporary Installations

- Along with Type NM and Type NMC cable, Type SE cable has been added to the acceptable cable assembly wiring methods for a temporary installation
- Type SE cable is now allowed for underground in installed in a raceway.
- Standard usage of SE cable does not allow for it to be used unground even if installed in a raceway. 338.12(A)(2).
- Branch Circuits of Type SE cable for temporary installations are also allowed in 590.4(C).

590.4(B) Feeders (Temporary Installations)

Type SE cable has been added to the acceptable cable assembly wiring methods for a temporary installation along with Type NM and Type NMC cable



*SAME CHANGE FOR TEMPORARY BRANCH CIRCUITS AT 590.4(C)

590.6(A)(1) GFCI - Temporary Installations

Receptacle Outlets Not Part of Permanent Wiring

- Receptacles supplied from permanent receptacles that are not GFCI are permitted to be used for power on construction sites if they supply receptacles once they go through a GFCI “Patch Cord” at the beginning of the cords. All 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets that are not a part of the permanent wiring of the building or structure have to be protected.
- TIA 70-14-6 provides the text used in this change.
- If cords could be protected at the end of their run, the supply side could be used without GFCI protection which could provide a damager to those using the cords.

