
CONTENTS

	<u>PAGE</u>
Article 518 - Assembly Occupancies _____	1
Article 520 - Theaters, Studios, etc. _____	5
Quiz #1 - Articles 518-520 _____	26
Quiz #2 - Article 520 _____	28
Article 522 - Control Systems Amusement Attractions ____	30
Article 525 - Carnivals, Circuses, Fairs _____	35
Article 530 - Motion Picture and Television Studios ____	42
Quiz #1 - Articles 522-530 _____	52
Article 540 - Motion Picture Projection Rooms _____	54
Article 545 - Manufactured Buildings _____	58
Article 547 - Agricultural Buildings _____	63
Quiz #1 - Articles 540-547 _____	71
Article 550 - Mobile Homes, Manufactured Homes ____	73
Quiz #1 - Article 550 _____	96
Article 551 - Recreational Vehicles and Parks _____	98
Quiz #1 - Article 551 _____	129

CONTENTS

	<u>PAGE</u>
Article 552 - Park Trailers _____	131
Quiz #1 - Article - 552 _____	156
Article 555 - Marinas, Boatyards, Docking Facilities _____	157
Quiz #1 - Article - 555 _____	170
Article 590 - Temporary Installations _____	172
Quiz #1 - Article - 590 _____	180
CHAPTER 6 - Article 600 - Electric Signs & Outline Lt.	182
Quiz #1 - Article - 600 _____	203
Quiz #2 - Article - 600 _____	205
Article 604 - Manufactured Wiring Systems _____	207
Article 605 - Office Furnishings _____	211
Article 610 - Cranes and Hoists _____	216
Quiz #1 - Articles 604-605-610 _____	227
Articles 620 - Elevators, Dumbwaiters, Escalators, etc. _____	229
Quiz #1 & 2 - Article 620 _____	252
ANSWERS _____	256

Part I. General

550.1. The provisions of this article cover the electric conductors and equipment installed within or on mobile homes and manufactured homes, and also the conductors that connect mobile homes and manufactured homes to a supply of electricity. A mobile home must comply with Article 550, even if it's not installed in a trailer park. A mobile home not intended as a dwelling unit (e.g., one used as a construction office) doesn't need to comply with the requirements in Article 550 regarding the number or capacity of circuits. 550.4

There are 10 definitions.

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



See the applicable building code for definition of permanent foundation.



•**Author's note:** What Are Manufactured Homes and Modular Homes? Manufactured homes – once referred to as single-wide and double-wide mobile homes – and modular homes are factory-built houses engineered and constructed to the strict specifications of the U.S. Department of Housing and Urban Development's federal building code.

Manufactured housing (commonly known as mobile homes in the United States) is a type of prefabricated housing that is largely assembled in factories and then transported to sites of use.

550.4 General Requirements.

Mobile Home NOT Intended as a Dwelling Unit. A mobile home **not** intended as a dwelling unit - for example, those equipped for sleeping purposes only, contractor's on-site offices, construction job dormitories, mobile studio dressing rooms, banks, clinics, mobile stores, or intended for the display or demonstration of merchandise or machinery - shall **not** be required to meet the provisions of this article pertaining to the number or capacity of circuits required. It shall, however, meet all other applicable requirements of this article if provided with an electrical installation intended to be energized from a 120 volt or 120/240 volt ac power supply system. Where different voltage is required by either design or available power supply system, adjustment shall be made in accordance with other articles and sections for the voltage used.



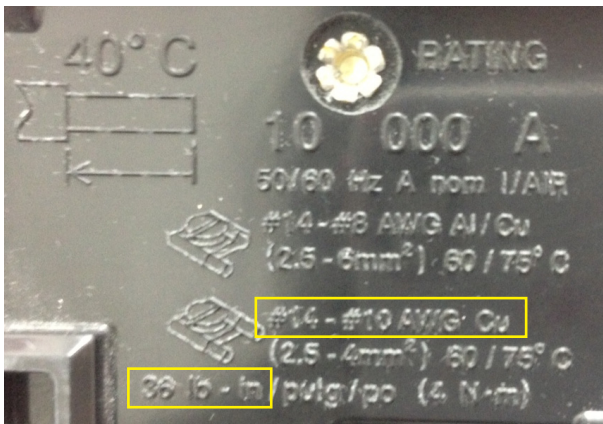
(A) In Other Than Mobile Home Parks. Mobile homes installed in other than mobile home parks shall comply with the provisions of this article.

(B) Connections to Wiring System. The provisions of this article shall apply to mobile homes intended for connection to a wiring system rated 120/240 volts, nominal, 3-wire ac, with a grounded neutral conductor.

(C) Listed and Labeled. All electrical materials, devices, appliances, fittings, and other equipment shall be listed and labeled by a qualified testing agency and shall be connected in an approved manner when installed.



•**Author's note:** Section 110.3(B) states: "Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling." What is disturbing to me is in the real world the *National Electrical Code* section 110.3(B) is not enforced on the torquing of connections. There's even a label inside the load center with the inch-pound torque specifications the manufacturer requires.



Most circuit breakers have the required inch-pound of torque molded into the side of the breaker.

Molded in the circuit breaker:

#14- #10 wire 36 lb-in torque.

The required inch-pound of torque **differs with each manufacturer** that has the product listed.



Because we live with the consequences of our work, we should pay especially close attention to even the smallest work detail.

The importance of properly torquing a connection cannot be stressed enough.

Part II. Mobile and Manufactured Homes

550.10 Power Supply

(A) **Feeder.** The power supply to the mobile home shall be a feeder assembly consisting of not more than one listed 50 ampere mobile home power-supply cord or a permanently installer feeder.



Exception #1: A mobile home that is factory equipped with gas or oil fired central heating equipment and cooking appliances shall be permitted to be provided with a listed mobile home power-supply cord rated 40 amperes.

Exception #2: A feeder assembly shall not be required for manufactured homes constructed in accordance with 550.32(B).

(B) **Power-Supply Cord.** If the mobile home has a power-supply cord, it shall be permanently attached to the panelboard, or to a junction box permanently connected to the panelboard, with the free end terminating in an attachment plug.

Cords with adapters and pigtail ends, extension cords, and similar items shall not be attached to, or shipped with, a mobile home.

A suitable clamp or the equivalent shall be provided at the panelboard knockout to afford strain relief for the cord to prevent strain from being transmitted to the terminals when the power-supply cord is handled in its intended manner.



The cord shall be a listed type with four conductors, one of which shall be identified by a continuous green color or a continuous green color with one or more yellow stripes for use as the **equipment grounding conductor**.



(C) **Attachment Plug Cap.** The attachment plug cap shall be 3-pole, 4-wire, grounding type, rated 50 amperes, 125/250 volts with a configuration as shown below. It shall be listed, by itself or as part of a power-supply cord assembly, for the purpose and shall be molded to or installed on the flexible cord so that it is secured tightly to the cord at the point where the cord enters the attachment plug cap. If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from cord.



PLUG CAP



RECEPTACLE

550.10(D) Overall Length of a Power-Supply Cord. The overall length of a power-supply cord, measured from the end of the cord, including bared leads, to the face of the attachment plug cap shall not be less than 21 feet and shall not exceed 36 1/2 feet. The length of the cord from the face of the attachment plug cap to the point where the cord enters the mobile home shall not be less than 20 feet.



•**Author's note:** ***** waiting on info from NFPA on the cord length 21'-36 1/2' WHY????
3 years later and I'm still sitting by my phone.

(E) Marking. The power-supply cord shall bear the following marking:

FOR USE WITH MOBILE HOMES - 40 AMPERES
or
FOR USE WITH MOBILE HOMES - 50 AMPERES

(F) Point of Entrance. The point of entrance of the feeder assembly to the mobile home shall be in the exterior wall, floor, or roof.

(G) Protected. Where the cord passes through walls or floors, it shall be protected by means of conduits and bushings or equivalent. The cord shall be permitted to be installed within the mobile home walls, provided a continuous raceway having a maximum size of 1 1/4" is installed from the branch-circuit panelboard to the underside of the mobile home floor.



(H) Protection Against Corrosion and Mechanical Damage. Permanent provisions shall be made for the protection of the attachment plug cap of the power-supply cord and any connector cord assembly or receptacle against corrosion and mechanical damage if such devices are in an exterior location while the mobile home is in transit.



(I) Mast Weatherhead or Raceway. Where the calculated load exceeds 50 amperes or where a permanent feeder is used, the supply shall be by means of the following:

(1) One mast weatherhead installation, installed in accordance with Article 230, containing **four** continuous, insulated, color-coded feeder conductors, one of which shall be the **equipment ground-conductor**.



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



550.11 Disconnecting Means and Branch-Circuit Protective Equipment. The branch-circuit equipment shall be permitted to be combined with the disconnecting means as a single assembly. Such a combination shall be permitted to be designated as a panelboard. If a fused panelboard is used, the maximum fuse size for the mains shall be plainly marked with lettering at least 1/4" high and visible when fuses are changed.

Where plug fuses and fuseholders are used, they shall be tamper-resistant Type S, enclosed in dead-front fuse panelboards, Electrical panelboards containing circuit breakers shall also be dead-front type.



(A) Disconnecting Means. A single disconnecting means shall be provided in each mobile home consisting of a circuit breaker, or a switch and fuses and its accessories installed in a readily accessible location near the point of entrance of the supply cord or conductors into the mobile home. The main circuit breakers or fuses shall be plainly marked "Main." This equipment shall contain a solderless type of grounding connection or bar for the purposes of grounding, with sufficient terminals for all grounding conductors. The terminations of the grounded circuit conductors shall be insulated in accordance with 550.16(A). The disconnecting equipment shall have a rating not less than the calculated load. The distribution equipment, either circuit breaker or fused type, shall be located a minimum of 24 inches from the bottom of such equipment to the floor level of the mobile home.



A panelboard shall be rated not less than 50 amperes and employ a 2-pole circuit breaker rated 40 amperes for a 40-ampere supply cord, or 50 amperes for a 50-ampere supply cord. A panelboard employing a disconnect switch and fuses shall be rated at 60 amperes and shall employ a single 2-pole, 60-ampere fuseholder with 40 or 50 ampere main fuses for 40 or 50 ampere supply cords, respectively. The outside of the panelboard shall be plainly marked with the fuse size.

The panelboard shall be located in an accessible location but shall **not** be located in a bathroom or clothes closet. A clear working space at least 30" wide and 30" in front of the panelboard shall be provided. This space shall extend from the floor to the top of the panelboard.



550.11(B) Branch-Circuit Protective Equipment. Branch-circuit distribution equipment shall be installed in each mobile home and shall include overcurrent protection for each branch circuit consisting of either circuit breakers or fuses.

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

- (1) Not more than the circuit conductors; and
- (2) Not more than 150% of the rating of a single appliance rated 13.3 amperes or more that is supplied by an individual branch circuit; but
- (3) Not more than the overcurrent protection size and of the type marked on the air conditioner or other motor-operated appliance.



(C) Two-Pole Circuit Breakers. Where circuit breakers are provided for branch-circuit protection, 240-volt circuits shall be protected by a 2-pole common or companion trip, or by circuit breakers with identified handle ties.

(D) Electrical Nameplates. A metal nameplate on the outside adjacent to the feeder assembly entrance shall read as follows:

**THIS CONNECTION FOR 120/240-VOLT
3-POLE, 4-WIRE, 60-HERTZ
_____ AMPERE SUPPLY**

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

550.12 Branch Circuits. The number of branch circuits required shall be determined in accordance with 550.12(A) through (E).

(A) Lighting. The number of branch circuits shall be based on 3 volt amps per square foot times the outside dimensions of the mobile home (coupler excluded) divided by (120 volts x amps) to determine the number of 15 or 20 ampere lighting area circuits.

Example: A standard mobile home today is 15' wide x 72' long = 1080 sq.ft. x 3 va = 3240 va.

A 15 amp circuit x 120 volts = 1800va. $3240va \div 1800va = 1.8$ or two 15 amp circuits.

A 20 amp circuit x 120 volts = 2400va. $3240va \div 2400va = 1.35$ or two 20 amp circuits.



550.12(B) Small Appliances. In kitchens, pantries, dining rooms, and breakfast rooms, two or more 20 ampere small-appliance circuits, in addition to the number of circuits required elsewhere in this section, shall be provided for all receptacle outlets required by 550.13(D) in these rooms. Such circuits shall have no other outlets.

Exception #1: Receptacle outlets installed solely for the electrical supply and support an electric clock in any the rooms specified in 550.12(B) shall be permitted.



Exception #2: Receptacle outlets installed to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter-mounted cooking units shall be permitted.



Exception #3: A single receptacle for refrigeration equipment shall be permitted to be supplied from an individual branch circuit rated 15 amperes or greater.



Countertop receptacle outlets installed in the kitchen shall be supplied by not less than two small-appliance circuit branch circuits, either or both of which shall be permitted to supply receptacle outlets in the kitchen and other locations specified in 550.12(B).

(C) Laundry Area. Where a laundry area is provided, a 20 amp branch circuit shall be provided to supply the laundry receptacle outlet(s). This circuit shall have no other outlets.



(D) General Appliances. (Including furnace, water heater, range, and central or room air conditioner, etc.). There shall be one or more circuits of adequate rating in accordance with the following:

Informational Note: For central air conditioning, see Article 440.

(1) The ampere rating of fixed appliances shall not be over 50% of the circuit rating if lighting outlets (receptacles, other than kitchen, dining area, and laundry, considered as lighting outlets) are on the same circuit.

550.12(D)(2)

(2) For fixed appliances on a circuit without lighting outlets, the sum of rated appliances shall not exceed the branch-circuit rating. Motor loads or continuous loads shall not exceed 80% of the branch-circuit rating.

(3) The rating of a single cord-and-plug-connected appliance on a circuit having no other outlets shall not exceed 80% of the circuit rating.

(4) The rating of a range branch circuit shall be based on the range demand as specified for ranges in 550.18(B)(5).

(E) Bathrooms. Bathroom receptacle outlets shall be supplied by at least one 20 ampere branch circuit. Such circuits shall have no outlets other than as provided for in 550.13(E)(2).



550.13 Receptacle Outlets.

(A) Grounding-Type Receptacle Outlets. All receptacle outlets shall comply with the following:

(1) Be of the grounding type.



(2) Be installed according to 406.4.

(3) Except where supplying specific appliances, be 15 or 20 ampere, 125 volt, either single or multiple type, and accept parallel-blade attachment plugs.



Definition of receptacle outlet: An outlet where one or more receptacles are installed.

(B) GFCI. All 125 volt, single-phase, 15 and 20 ampere receptacle outlets installed in the locations specified in 550.13(B)(1) through (5) shall have GFCI protection for personnel.

- (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 6' of the outer edge of the sink
- (5) Dishwashers



550.13(C) Cord-Connected Fixed Appliance. A grounding-type receptacle outlet shall be provided for each cord connected fixed appliance installed.

(D) Receptacle Outlets Required. Except on the bath, closet, and hallway areas, receptacle outlets shall be installed at wall spaces 2 feet wide or more so that no point along the floor line is more than 6 feet measured horizontally from an outlet in that space. In addition, a receptacle outlet shall be installed in the following locations:

(1) Over or adjacent to countertops in kitchen [at least one on each side of the sink if countertops are on each side of the sink and are 12 inches or over in width.]



(2) Adjacent to the refrigerator and freestanding gas-range space. A multiple-type receptacle shall be permitted to serve as the outlet for a countertop and refrigerator.



(3) At countertop spaces for built-in vanities.

(4) At countertop spaces under wall-mounted cabinets.

(5) In the wall at the nearest point to where a bar-type counter attaches to the wall.

(6) In the wall at the nearest point to where a fixed room divider attaches to the wall.

(7) In laundry area within 6 feet of the intended location of the laundry appliance(s).



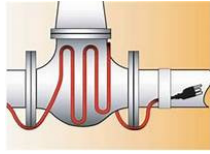
(8) At least one receptacle outlet located outdoors and accessible at grade level and not more than 6 1/2 feet above grade.



(9) At least one receptacle outlet shall be installed in bathrooms within 36 inches of the outside edge of each basin. The receptacle outlet shall be located above or adjacent to the basin location. This receptacle shall be in addition to any receptacle that is part of a luminaire or appliance. The receptacle shall not be enclosed within a bathroom cabinet or vanity.



(E) Pipe-Heating Cable(s) Outlet. For the connection of pipe heating cable(s), a receptacle outlet shall be located on the underside of the unit as follows:



- (1) Within 2 feet of the cold water inlet.
- (2) Connected to an interior branch circuit, other than a small-appliance branch circuit. It shall be permitted to use a bathroom receptacle circuit for this purpose.



- (3) On a circuit where all of the outlets are on the load side of the GFCI.
- (4) This outlet shall not be considered as the receptacle required by 550.13(D)(8).

(F) Receptacle Outlets NOT Permitted. Receptacle outlets shall **not** be permitted in the following locations:

- (1) Receptacle outlets shall **not** be installed within or directly over a bathtub or shower space.



- (2) A receptacle shall not be installed in a face-up position in any countertop.
- (3) Receptacle outlets shall not be installed above electric baseboard heaters, unless provided for in the listing or manufacturer's instructions.

(G) Receptacle Outlets NOT Required. Receptacle outlets shall **not** be required in the following locations:

- (1) In the wall space occupied by built-in kitchen or wardrobe cabinets.



- (2) In the wall space behind doors that can be opened fully against a wall surface.
- (3) In room dividers of the lattice type that are less than 8 feet long, not solid, and within 6 inches of the floor.
- (4) In the wall space afforded by bar-type counters.

550.14 Luminaires and Appliances.

(A) **Fasten Appliances in Transit.** Means shall be provided to securely fasten appliances when the mobile home is in transit. (See 550.16 for provisions on grounding).

(B) **Accessibility.** Every appliance shall be accessible for inspection, service, repair, or replacement without removal of permanent construction.

(C) **Pendants.** Listed pendant-type luminaires or pendant cords shall be permitted.



(D) **Bathtub and Shower Luminaires.** Where a luminaire is installed over a bathtub or in a shower stall, it shall be of the enclosed and gasketed type listed for wet locations.



550.15 Wiring Methods and Materials. Except as specifically limited in this section, the wiring methods and materials included in this *Code* shall be used in mobile homes. Aluminum conductors, aluminum alloy conductors, and aluminum core conductors such as copper-clad aluminum **shall be permitted** for use where used with equipment listed for aluminum conductor connections.

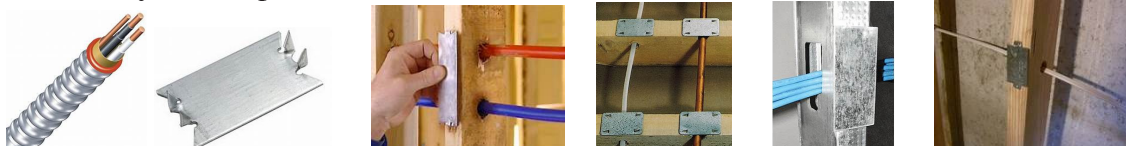
(A) **Nonmetallic Boxes.** Nonmetallic boxes shall be permitted only with nonmetallic cable or non-metallic raceways.



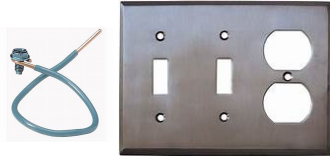
(B) **Nonmetallic Cable Protection.** Nonmetallic cable located 15 inches or less above the floor, if exposed, shall be protected from physical damage by covering boards, guard strips, or raceways. Cable likely to be damaged by stowage shall be so protected in all cases.



(C) **Metal-Covered and Nonmetallic Cable Protection.** Metal-covered and nonmetallic cable shall be permitted to pass through the centers of the wide side of 2 by 4 studs. However, they shall be protected where they pass through 2 by 2 studs or at other studs or frames where the cable or armor would be less than 1 1/4" from the inside or outside surface of the studs where the wall covering materials are in contact with the studs. Steel plates on each side of the cable, or a tube, with not less than 0.053" wall thickness shall be required to protect the cable. These plates or tubes shall be securely held in place.



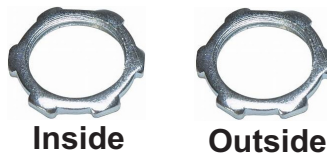
(D) Metal Faceplates. Where metal faceplates are used, the installation shall comply with 404.9(B) and 406.6(B).



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



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



(G) Switches. Switches shall be rated as follows:

- (1) For lighting circuits, switches shall be rated not less than 10 amperes, 120 to 125 volts, and in no case less than the connected load.
- (2) Switches for motor or other loads shall comply with the provisions of 404.14.

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

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

IDENTIFIED

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



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

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



(J) Appliance Terminal Connections. Appliances having branch-circuit terminal connections that operate at temperatures higher than 140°F shall have circuit conductors as described in the following:

- (1) Branch-circuit conductors having an insulation suitable for the temperature encountered shall be permitted to be run directly to the appliance.
- (2) Conductors having an insulation suitable for the temperature encountered shall be run from the appliance terminal connection to a readily accessible outlet box placed at least one foot from the appliance. These conductors shall be in a suitable raceway or Type AC or MC cable of at least 18”.



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



IDENTIFIED



550.16 Grounding. Grounding of both electrical and nonelectrical metals parts in a mobile home shall be through connection to a grounding bus in the mobile home panelboard and shall be connected through the green-colored insulated conductor in the supply cord or the feeder wiring to the grounding bus in the service-entrance equipment located adjacent to the mobile home location. Neither the frame of the mobile home nor the frame of any appliance shall be connected to the grounded circuit conductor in the mobile home. Where the panelboard is the service equipment as permitted by 550.32(B), the neutral conductors and the **equipment grounding** bus shall be connected.

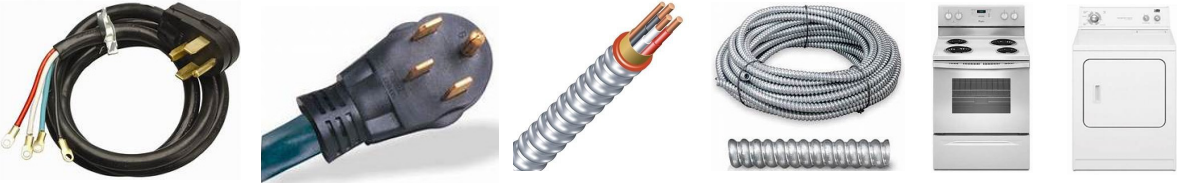


550.16(A) Grounded Conductor.

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

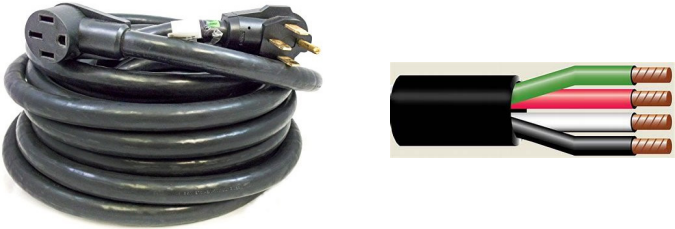


(2) **Connections of Ranges and Clothes Dryers.** Connections of ranges and clothes dryers with 120/240 volt, 3-wire ratings shall be made with a 4-conductor cord and 3-pole, 4-wire, grounding-type plugs or by Type AC cable, Type MC cable, or conductors enclosed in flexible metal conduit.



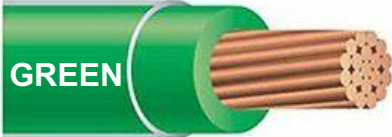
550.16(B) Equipment Grounding Means.

(1) **Supply Cord or Permanent Feeder.** The green-colored insulated **equipment grounding wire** in the supply cord or permanent feeder wiring shall be connected to the grounding bus in the panelboard or disconnecting means.



(2) **Electrical System.** In the electrical system, all exposed metal parts, enclosures, frames, luminaire canopies, and so forth, shall be effectively bonded to the **equipment grounding terminal** or enclosure of the panelboard.

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



Article 620 Quiz #1 - Open Book

•Circle your choice of answer and write the Code section where it was found.

#1. Elevators shall have a single means for disconnecting car light, receptacle(s) and ventilation power supply. This disconnect shall be _____ to correspond to the specific elevator car number whose power it controls.

- (a) mounted (b) located (c) numbered (d) fused

#2. An elevator room shall have a car light disconnecting means it shall be numbered to correspond to the identifying number of the elevator car whose _____.

- (a) light source they control (b) panelboard it is fed from
(c) branch circuit feeding it (d) all of these

#3. Selective coordination shall be selected by a _____ professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems.

- (a) graduate (b) licensed (c) registered (d) approved

#4. The minimum size conductor permitted in parallel for elevator lighting is _____, provided the ampacity is equivalent to a #14 wire.

- (a) #14 (b) #20 (c) #16 (d) #1/0

#5. The minimum size conductor for lighting elevator circuits traveling cables is _____.

- (a) #12 (b) #18 (c) #16 (d) #14

#6. In an elevator machine room, at least _____ receptacle(s) shall be installed.

- (a) one duplex (b) two duplex (c) one single (d) two receptacles, opposite walls

#7. For elevator systems that regenerate power back into the power source, which is unable to absorb the regenerative power under overhauling elevator load condition, _____.

- (a) a transfer switch shall be installed to connect the regenerative power to the main power source
(b) a disconnect switch shall be labeled "caution regenerative power available"
(c) a means shall be provided to absorb this power
(d) the elevator shall be locked out immediately

#8. Escalator motors shall be classified as ____ duty.

- (a) **intermittent** (b) **varying** (c) **short-time** (d) **continuous**

#9. Conductors to the hoistway door interlocks from the hoistway riser shall be ____.

- (a) **flame retardant** (b) **type SF or equivalent**
(c) **rated 200 degrees C** (d) **all of these**

#10. The heating of conductors depends on ____ values which, with generator field control, are reflected by the nameplate current rating of the motor-generator set driving motor rather than by the rating of the elevator motor, which represents actual but short-time and intermittent F.L.C. values.

- (a) **root-mean-square current** (b) **voltage**
(c) **ambient temperature** (d) **ozone**

#11. Where the driving machine of an electric elevator or the hydraulic machine of a hydraulic elevator is located in a remote machine room or remote machinery space, a _____ means for disconnecting all ungrounded main power supply conductors shall be provided and be capable of being locked in the open position.

- (a) **multiple** (b) **duplicate** (c) **local** (d) **single**

#12. A separate branch circuit shall supply the ____ receptacles, auxiliary power source, and ventilation on each elevator car.

- (a) **motor** (b) **car lights** (c) **emergency phone** (d) **emergency exit**

#13. Each 125-volt single-phase 15 and 20 ampere receptacle installed in pits, in hoistways, on elevator car tops, and in escalator and moving walk wellways shall be ____ circuit interruption type to protect personnel.

- (a) **REN** (b) **GFCI** (c) **FRN** (d) **NON 205**

#14. Hoistways and cars shall have their traveling cables supported by which of the following methods?

- (a) **Support is not required if less than 100 feet.**
(b) **By looping the cables around supports for unsupported lengths less than 30 m (100 ft).**
(c) **By suspending from the supports by a means that automatically tightens around the cable when tension is increased for unsupported lengths up to 120 m (400 ft).**
(d) **Support is not required if less than 75 feet.**