

**CITY OF PHOENIX AMENDMENTS
TO THE 2008 NATIONAL ELECTRICAL CODE (NEC)
Approved on April 1, 2009**

ARTICLE 210 - Branch Circuits

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.

FPN: See 215.9 for ground-fault circuit-interrupter protection for personnel on feeders.

(A) All Occupancies. All 125-volt, single -phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through (9) shall have ground-fault circuit-interrupter protection for personnel.

(1) Bathrooms

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

(3) Outdoors

Exception No. 1 to (3): Receptacles that are not readily accessible and are supplied by a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with 426.28.

Exception No. 2 to (3): In industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power is interrupted or having a design that is not compatible with GFCI protection.

(4) Crawl spaces — at or below grade level

(5) Unfinished basements — for purposes of this section, unfinished basements are defined as portions or areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and the like

Exception to (5): A receptacle supplying only a permanently installed fire alarm or burglar alarm system shall not be required to have ground-fault circuit-interrupter protection.

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

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

(6) Kitchens

(a) Dwelling units – where the receptacles are installed to serve the countertop surfaces

(b) Other than dwelling units – all locations

(7) Sinks - where the receptacles are installed within 1.8 m (6 ft) of the outside edge of the sink

Exception No. 1 to (7): In industrial laboratories, receptacles used to supply equipment where removal of power would introduce a greater hazard shall be permitted to be installed without GFCI protection.

Exception No. 2 to (7): For receptacles located in patient care areas of health care facilities other than those covered under 210.8(A)(1), GFCI protection shall not be required.

(8) Boathouses

(9) Indoors:

(a) Damp locations

(b) Wet locations

(B) Boat Hoists. GFCI protection shall be provided for outlets not exceeding 240 volts that supply boat hoists installed in dwelling unit locations.

ARTICLE 250 - Grounding and Bonding

250.118 Types of Equipment Grounding Conductors.

The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

FPN: For effective ground-fault current path, see 250.2 Definition.

(1) A copper, aluminum, or copper-clad aluminum conductor. This conductor shall be solid or stranded; insulated, covered, or bare; and in the form of a wire or a busbar of any shape.

(2) Rigid metal conduit.

(3) Intermediate metal conduit.

(4) Electrical metallic tubing with an additional equipment grounding conductor.

(5) Listed flexible metal conduit with an additional equipment grounding conductor, and meeting all the following conditions:

a. The conduit is terminated in listed fittings.

b. The combined length of flexible metal conduit ~~and flexible metallic tubing~~ and liquidtight flexible metal conduit in the same ground return path does not exceed 1.8 m (6 ft) for feeders and 15 m (50 ft) for branch circuits.

c. The additional equipment grounding conductor is terminated at each termination or junction point.

(6) Listed liquidtight flexible metal conduit meeting all the following conditions:

a. The conduit is terminated in listed fittings.

b. For metric designators 12 through 16 (trade sizes 3/8 through 1/2), the circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.

c. For metric designators 21 through 35 (trade sizes 3/4 through 1-1/4), the circuit conductors contained in the conduit are protected by overcurrent devices rated not more than 60 amperes and there is no flexible metal conduit, flexible metallic tubing, or liquidtight flexible metal conduit in trade sizes metric designators 12 through 16 (trade sizes 3/8 through 1/2) in the grounding path.

d. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 1.8 m (6 ft).

e. Where used to connect equipment where flexibility is necessary after installation, an equipment grounding conductor shall be installed.

(7) Listed liquidtight flexible metal conduit with an additional equipment grounding conductor and meeting all of the following conditions:

a. The conduit is terminated in listed fittings.

b. The combined length of liquidtight flexible metal conduit and flexible metal conduit in the same ground return path does not exceed 15 m (50 ft) for branch circuits and 1.8 m (6 ft) for feeders.

c. The additional equipment grounding conductor is terminated at each termination or junction point.

(8) Flexible metallic tubing where the tubing is terminated in listed fittings and meeting the following conditions:

a. The circuit conductors contained in the tubing are protected by overcurrent devices rated at 20 amperes or less.

b. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 1.8 m (6 ft).

(9) Armor of Type AC cable with an additional equipment grounding conductor and as provided in 320.108.

- (10) The copper sheath of mineral-insulated, metal-sheathed cable.
- (11) Type MC cable where listed and identified for grounding in accordance with the following:
 - a. The combined metallic sheath and grounding conductor of interlocked metal tape-type MC cable
 - b. The metallic sheath or the combined metallic sheath and grounding conductors of the smooth or corrugated tube-type MC cable
- (12) Cable trays as permitted in 392.3 and 392.7.
- (13) Cablebus framework as permitted in 370.3.
- (14) Other listed electrically continuous metal raceways and listed auxiliary gutters.
- (15) Surface metal raceways listed for grounding.

ARTICLE 334 – Nonmetallic-Sheathed Cable; Types NM, NMC and NMS

II. Installation

334.10 Uses Permitted. Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

- (1) One- and two-family dwellings.
- (2) Multifamily dwellings permitted to be of Types III, IV, and V construction.
- (3) Other dwelling unit accessory buildings and structures in accordance with 334.10(1) and (2).

FPN No. 1: Types of building construction and occupancy classifications are defined in NFPA 220-2006, *Standard on Types of Building Construction*, or the applicable building code, or both.

FPN No. 2: See Annex E for determination of building types [NFPA 220, Table 3-1].

- (4) Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.

FPN: See 310.10 for temperature limitation of conductors.

(A) Type NM. Type NM cable shall be permitted as follows:

- (1) For both exposed and concealed work in normally dry locations.
- (2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC. Type NMC cable shall be permitted as follows:

- (1) For both exposed and concealed work in dry, moist, damp, or corrosive locations.
- (2) In outside and inside walls of masonry block or tile
- (3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (1/16 in.) thick and covered with plaster, adobe, or similar finish

(C) Type NMS. Type NMS cable shall be permitted as follows:

- (1) For both exposed and concealed work in normally dry locations/
- (2) To be installed or fished in air voids in masonry block or tile walls

334.12 Uses Not Permitted.

(A) Types NM, NMC, and NMS. Types NM, NMC, and NMS cables shall not be permitted as follows:

- (1) In any dwelling or structure not specifically permitted in 334.10(1), (2), and (3)
- (2) As service-entrance cable
- (3) In hoistways or on elevators or escalators
- (4) Embedded in poured cement, concrete, or aggregate

(B) Types NM and NMS. Types NM and NMS cables shall not be used under the following conditions or in the following locations:

- (1) Where exposed to corrosive fumes or vapors
- (2) Where embedded in masonry, concrete, adobe, fill, or plaster
- (3) In a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish
- (4) In wet or damp locations