ARTICLE VIII. NATIONAL ELECTRICAL CODE

Sec. 8-800. Adopted; where filed; amendments.

(a) That certain document known as the "National Electrical Code, 2008 Edition," which has been published as a code in book form by the National Fire Protection Association entitled "National Electrical Code, N.F.P.A. No. 70 - 2008 Edition," Article 90 and chapters one through eight, three (3) copies with amendments of which are on file in the office of the city clerk, and this same code is hereby referred to, adopted and made a part hereof, as if fully set out in this article.

(b) The provisions of this article, other than subsections (a) and (b) of this section, are amendments to the National Electrical Code as now or hereafter adopted in subsection (a). All sections in this article, other than subsections (a) and (b) of this section, shall be considered to be both a part of this code and a part of the National Electrical Code.
(Ord. No. 2008.72, 12-11-08)

Charter reference—Adoption by reference, § 2.14.
State law reference—Adoption by reference, A.R.S. § 9-801 et seq.

Art. 110. Requirements for electrical installations.

Article 110.7 is hereby amended as follows:

110.7. Wiring integrity. Completed wiring installations shall be free from short circuits, ground faults, or any connections to ground other than those required or permitted elsewhere in this code.

All equipment rated at one thousand (1,000) amperes or more shall be tested in conformance with UL Standard 869 or 891 for insulation breakdown prior to its being energized. This test shall be performed by an independent testing facility or agency approved by the authority having jurisdiction.
(Ord. No. 2008.72, 12-11-08)

Art. 210. Branch circuits.

Article 210.5, *Identification for branch circuits,* is hereby amended by adding section (D) as follows:

210.5(D). Color code. Where fifteen (15), twenty (20), or thirty (30) ampere branch circuits requiring a neutral, are installed in raceways, the conductors of branch circuits connected to the same system shall conform to the following color code:

Volts	Phase	System	Phase A	Phase B	Phase C	Neutral
120/208	3	Wye	Black	Red	Blue	White
277/480	3	Wye	Brown	Orange	Yellow	Gray
120/240	3	Delta	Black	Orange	Blue or Red	White

EXCEPTIONS:

1. The above color coding is not required in residential occupancies.

2. Industrial occupancies holding their own maintenance license may use their own color coding system.

3. Conductors of listed cable assemblies shall be permitted to be permanently re-identified at the time of installation by distinctive markings at each outlet or termination where the conductor is visible and accessible; such as, six (6) inch (152 mm) taping or other effective means.

4. Additions to an existing electrical system, where an acceptable color coding system exists, the existing color coding system shall be continued.

(Ord. No. 2008.72, 12-11-08)

Art. 220. Branch-circuit, feeder, and service calculations.

Article 220.82, *Dwelling unit*, is hereby amended by adding subsection (B)(5) as follows:

*220.82(B)(*5). For purposes of calculations and installation requirements, the following loads and branch circuit requirements may be used where the actual nameplate rating is not available.

	LOAD	**CONDUCTOR AMPACITY**	**SINGLE PHASE NOMINAL VOLTAGE**
Electric Clothes Dryer	5000 VA	30 Ampere	(120/240V)
Water Heater	4500 VA	30 Ampere	(240V)
Dishwasher	1500 VA	20 Ampere	(120V)
Garbage Disposal	720 VA	20 Ampere	(120V)
Evaporative Cooler	1200 VA	20 Ampere	(120V)
Compactor	1500 VA	20 Ampere	(120V)
Wall Mounted Oven Or Counter Mounted Cooking Units	6000 VA	30 Ampere	(120/240V)
Range	12000 VA	50 Ampere	(120/240V)
Gas Fired Clothes Dryer	1500 VA	20 Ampere	(120V)
Clothes Washer	1500 VA	20 Ampere	(120V)
Microwave Ovens (Fixed)	1200 VA	20 Ampere	(120V)

Note: The above calculations are without appropriate NEC demands, which may be taken where permitted in the NEC.

If appliances are installed having higher nameplate ratings than the minimum loads specified above, the conductors shall be increased to the proper size. Where limited storage capacity water heaters are specified, the nameplate rating of the unit(s) shall be used.
(Ord. No. 2008.72, 12-11-08)

Art. 225. Outside branch circuits and feeders.

Article 225.32, *Location,* is hereby amended by adding Exception 5 as follows:

EXCEPTION NO. 5: For free-standing canopies, carports, towers, and similar structures; a branch circuit disconnecting means shall be permitted to be located elsewhere on the premises. A grounding electrode conductor sized per 250.66 shall be run with the circuit conductors.
(Ord. No. 2008.72, 12-11-08)

Art. 230. Services.

Article 230.28 is hereby amended as follows:

230.28. Service masts as supports. Where a service mast is used for the support of service-drop conductors, it shall be of adequate strength. The service mast shall be rigid steel conduit or intermediate metal conduit, not less than one and one-half (1-1/2) inch trade size, and shall not contain any coupling(s) which would be subject to strain by the service-drop. Where the service-drop point of attachment exceeds eighteen (18) inches (457 mm) above the roof or thirty (30) inches (762 mm) above the final raceway support, the service mast shall be supported by braces or guys to withstand safely the strain imposed by the service-drop. Where raceway-type service masts are used, all raeway fittings shall be identified for use with service masts. Only power service-drop conductors shall be permitted to be attached to a service mast.

(FPN): Lag screws are not acceptable. See local electrical utility specifications.

Article 230.43 is hereby amended as follows:

230.43. Wiring methods for 600 volts, nominal, or less. Service-entrance conductors shall be installed in accordance with the applicable requirements of this code covering the type of wiring method used and shall be limited to the following methods:

(1) Rigid metal conduit

(2) Intermediate metal conduit

(3) Wireways

(4) Busways

(5) Auxiliary gutters

(6) Rigid non-metalic conduit may be used underground

(7) Schedule 80 rigid non-metalic conduit may extend above ground to the service equipment.

(FPN): Refer to the electric utility requirements for additional information on installing service-entrance conductors on or within buildings and underground serving the premises.

Article 230.70(A)(1) is hereby amended as follows:

230.70(A)(1). Readily accessible location. The service disconnecting means shall be installed at a readily accessible location either outside of a building or structure, or inside nearest the point of entrance of the service conductors. The service disconnecting means shall be installed adjacent to and accessible from the same working area as the utility meter.

All service disconnecting means located inside a building shall be enclosed within a room or space separated from the rest of the building by not less than a one-hour fire-resistive fire barrier.

EXCEPTIONS:

1. Open parking structures.

2. The ceiling of this service entrance room may be constructed as required for a one-hour wall assembly with protected openings. For the purpose of this section only, a one-hour rated wall assembly may be used in a horizontal position.

(Ord. No. 2008.72, 12-11-08)

Art. 250. Grounding and bonding.

Article 250.118 is hereby amended as follows:

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:

(1) A copper or other corrosion-resistant 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 with an individual equipment grounding conductor.

(3) Intermediate metal conduit with an individual equipment grounding conductor.

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

(5) Flexible metal conduit with an individual equipment grounding conductor.

(6) Type AC cable with an individual equipment grounding conductor.

(7) The copper sheath of mineral-insulated, metal-sheathed cable.

(8) Type MC cable with an individual equipment grounding conductor.

(9) Cable trays as permitted in 392.7.

(10) Cablebus framework as permitted in 370.3.

(11) Other electrically continuous metal raceways listed for grounding.
(Ord. No. 2008.72, 12-11-08)

Art. 310. Conductors for general wiring.

Article 310.15(B)(6) is hereby amended as follows:

310.15(B)(6). 120/240-volt, 3-wire, single-phase dwelling services and feeders. For individual dwelling units of one-family, two-family, and multi-family dwellings, conductors, as listed in Table 310.15(B)(6), shall be permitted as 120/240-volt, 3-wire, single-phase service-entrance conductors, service lateral conductors, and feeder conductors that serve as the main power feeder to a dwelling unit and are installed in raceway or cable with or without an equipment grounding conductor. For application of this section, the main power feeder shall be in the feeder between the main disconnect and the panelboard that supplies, either by branch circuits or by feeders, or both, all loads that are part or associated with the dwelling unit. The feeder conductors to a dwelling unit shall not be required to have an allowable ampacity rating greater than their service-entrance conductors. The grounded conductor shall be permitted to be smaller than the ungrounded conductors, provided the requirements of 215.2, 220.61, and 230.42 are met.

Conductor Types and Sizes RHH RHW RHW-2 THHN THHW THW THW-2 THWN THWN-2 XHHW XHHW-2 SE USE USE-2		
Copper	**Aluminum or Copper-Clad Aluminum**	**Service or Feeder Rating in Amps > 30°C (86°F)**
AWG	AWG	
4	2	—
3	1	—
2	1/0	100
1	2/0	125
1/0	3/0	150
2/0	4/0	175
3/0	250 kcmil	200
4/0	300 kcmil	225
250 kcmil	350 kcmil	250
350 kcmil	500 kcmil	300
400 kcmil	600 kcmil	350
500 kcmil	750 kcmil	400

(Ord. No. 2008.72, 12-11-08)

Art. 334. Nonmetallic-sheathed cable: Types NM, NMC, and NMS.

Article 334.10 is hereby amended as follows:

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

(1) One- and two-family dwellings and their accessory structures.

(2) Within the dwelling units of multifamily dwellings permitted to be Types III, IV, and V construction except as prohibited in 334.12.

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

(Ord. No. 2008.72, 12-11-08)

Art. 348. Flexible metal conduit: Type FMC.

Article 348.60 is hereby amended as follows:

348.60. Grounding. Flexible metal conduit shall provide an adequate path for equipment grounding as required by 250.118.
(Ord. No. 2008.72, 12-11-08)

Art. 350. Liquidtight flexible metal conduit: Type LFMC.

Article 350.60 is hereby amended as follows:

350.60. Grounding. Liquidtight flexible metal conduit shall provide an adequate path for equipment grounding as required by 250.118.
(Ord. No. 2008.72, 12-11-08)

Art. 501. Class I locations.

Article 501.30(B) is hereby amended as follows:

501.30(B). Types of equipment grounding conductors. Where flexible metal conduit or liquidtight flexible metal conduit is used as permitted in 501.10(B)(2) and is to be relied upon to complete a sole equipment grounding path, it shall be installed with internal or external bonding jumpers in parallel with each conduit and complying with 250.102.
(Ord. No. 2008.72, 12-11-08)

Art. 502. Class II locations.

Article 502.30(B) is hereby amended as follows:

502.30(B). Types of equipment grounding conductors. Where flexible conduit is used as permitted in 502.10, it shall be installed with internal or external bonding jumpers in parallel with each conduit and complying with 250.102.
(Ord. No. 2008.72, 12-11-08)

Art. 503. Class III locations.

Article 503.30(B) is hereby amended as follows:

503.30(B). Types of equipment grounding conductors. Where flexible conduit is used as permitted in 503.10, it shall be installed with internal or external bonding jumpers in parallel with each conduit and complying with 250.102.
(Ord. No. 2008.72, 12-11-08)

Art. 680. Swimming pools, fountains, and similar installations.

Article 680 is hereby amended by adding Article 680.13 as follows:

680.13. Mechanical and electrical equipment location. Mechanical and electrical equipment not addressed in other sections in Article 680, shall not be permitted within the area extending six (6) feet (1.83 m) horizontally from the inside wall of the pool.

EXCEPTION: Listed swimming pool covers where the electrical equipment is part of the total assembly.

(FPN): In determining the above dimension the distance to be measured is the shortest path to the equipment without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other similar effective permanent barrier.
(Ord. No. 2008.72, 12-11-08)

Art. 725. Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits.

Article 725 is hereby amended by adding Article 725.32 as follows:

725.32. Bell and signal transformers. In residential occupancies, bell or signal transformers shall not be installed in attics, closets, or in any inaccessible concealed place.
(Ord. No. 2008.72, 12-11-08)

Secs. 8-801—8-899. Reserved.