ARTICLE VI. - ELECTRICAL CODE

Sec. 10-51. - Adoption of National Electrical Code (~~2017~~2020).

The ~~2017~~2020 edition of the *National Electrical Code*, promulgated as a standard by the National Fire Protection Association, is adopted and incorporated in this article by reference as if fully set forth, except as it is amended by the following provisions of section 10-52. Provisions of this article are in addition to the provisions of the *National Electrical Code*. The following provisions coinciding with the provisions of the *National Electrical Code* supersede, repeal, or delete, when indicated, the corresponding provisions of the *National Electrical Code*.

All references within the model codes to any building, electrical, fuel gas, mechanical, plumbing, energy conservation, ~~or~~ existing building, or swimming pool code shall be construed to be a reference to the respective building, electrical, fuel gas, mechanical, plumbing, energy conservation, existing building, or swimming pool code specifically adopted by reference in Articles II through XI~~I~~VI~~I~~ of this chapter.

Sec. 10-52. - Amendments to the adopted chapters of the National Electrical Code (~~2017~~2020).

Additions to the National Electrical Code (NEC) are shown as underlined text. Deletions of the NEC are shown as bracketed [~~strikethroughs~~].

Article 200.6, Means of Identifying Grounded Conductors, paragraphs (A), (A)(1), (A)(2), A(3) and paragraphs (B), (B)(1), (B)(2), (B)(3) and (B)(4) are amended as follows, with all other Code text remaining as is:

200.6. Means of Identifying Grounded Conductors.

(A) Sizes 10 [~~6~~] AWG or Smaller. An insulated grounded conductor of 10 [~~6~~] AWG or smaller shall be identified by one of the following means:

(A) (1) The insulated conductor shall have a~~A~~ continuous white outer finish shall be used on all systems with a voltage of less than 150 Volts between the grounded and ungrounded conductors.

(A) (2) The insulated conductor shall have a~~A~~ continuous gray outer finish shall be used on all systems with a voltage of 150 Volts or higher between the grounded and ungrounded conductors.

[~~(A) (3) [The insulated conductor shall have T~~~~three continuous white or gray stripes along the conductor's entire length on other than green insulation.]~~

(B) Sizes 8 [~~4~~] AWG or Larger. An insulated grounded conductor 8 [~~4~~] AWG or larger shall be identified by one of the following means:

(B) (1) A continuous white outer finish shall be used on all systems with a voltage of less than 150 Volts between the grounded and ungrounded conductors.

(B) (2) A continuous gray outer finish shall be used on all systems with a voltage of 150 Volts or higher between the grounded and ungrounded conductors.

[~~(B) (3) Three continuous white or gray stripes along the conductor's entire length on other than green insulation~~.]

(B) (3) [~~(4)~~] At the time of installation, by a distinctive white or gray marking tape at its terminations. The [~~This~~] marking tape shall encircle the conductor or insulation a minimum of two-inches in length.

Article 200.7, Use of Insulation of a White or Gray Color or with Three Continuous White or Gray Stripes, is amended just on the title as follows; all other Code text remains as is in the NEC ~~2017~~2020:

200.7 Use of Insulation of a White or Gray Color or with Three Continuous White or Gray Stripes on Cables Listed in Article 334.

Article 210.5, Identification for Branch Circuits, paragraphs (C)(1)(a), (C)(2), (C)(2)(a) and (C)(2)(b) are amended as follows, all other Code text remains as is:

210.5 Identification for Branch Circuits.

(C). Identification of Ungrounded Conductors. Ungrounded conductors shall be identified in accordance with 210.5(C)(1) or (2), as applicable.

(1) Branch Circuits Supplied from More Than One Nominal Voltage System. Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and by system voltage class at all termination, connection, and ~~spice~~splice points in compliance with 210.5(C)(1)(a) and (b). Different systems within the same premises that have the same system voltage class shall be permitted to use the same identification.

(a) *Means of Identification.* Conductors 10 AWG and smaller shall have factory colored insulation. Conductors 8 AWG and larger may have factory colored insulation or black insulation with a marking tape that encircles the insulation a minimum of two-inches in length. Color of insulation or marking tape shall comply with the following table: [~~The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means.~~]

UNGROUNDED CONDUCTOR IDENTIFICATION COLORS FOR ELECTRICAL SYSTEMS			
208Y/120 Volts	**120/240 Volts**	**480Y/277 Volts**	**120/240 Volts**
Three phase	**Three phase**	**Three phase**	**Single phase**
A - Black	A - Black	A - Purple	A - Black
B - Red	B - Orange (high leg)	B - Brown	B - Red
C - Blue	C - Blue	C - Yellow	

Informational Note 1: Conductors used for switch legs shall be the same color as the branch circuit conductors.

Informational Note 2: Conductors used for travelers may be of the same color as its associated switch leg or may be any of the above colors not used on the project. The colors designated for the grounded conductor, grounding conductors or for identification of the high leg may not be used for travelers.

Informational Note 3: In existing installations where modifications to the electrical system are required, and there is an established system of colors for ungrounded conductors, the existing color coding system may continue to be used.

(2) Branch Circuits Supplied From Direct-Current Systems. Where a branch circuit is supplied from a dc system operating at more than 60 volts, each ungrounded conductor of 8 ~~[4]~~ AWG or larger shall be identified by polarity at all termination, connection, and splice points by marking tape, tagging, or other approved means; each ungrounded conductor of 10 ~~[6]~~ AWG or smaller shall be identified by polarity at all termination, connection, and splice points in compliance with 210.5(C)(2)(a) and (b). The identification methods utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment.

(a) *Positive Polarity, Sizes 10 ~~[6]~~ AWG or Smaller.* Where the positive polarity of a dc system does not serve as the connection point for the grounded conductor, each positive ungrounded conductor shall be identified by one of the following means:

* * * * *

(b) *Negative Polarity, Sizes 10 ~~[6]~~ AWG or Smaller*. Where the negative polarity of a dc system does not serve as the connection point for the grounded conductor, each negative ungrounded conductor shall be identified by one of the following means:

Article 210.8, Ground-Fault Circuit-Interrupter Protection for Personnel, paragraph (F)Outdoor Outlets, is deleted as follows, all other code text remains as is:

~~[(F) **Outdoor Outlets.** All outdoor outlets for dwellings, other than those covered in 210.8(A) (3), Exception to (3), that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less, shall have ground-fault circuit-interrupter protection for personnel.~~

~~*Exception: Ground-fault circuit-interrupter protection shall not be required on lighting outlets other than those covered in 210.8(C)]*~~

* * * * *

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~~*Exception: Ground-fault circuit-interrupter protection shall not be required on lighting outlets other than those covered in 210.8(C)]*~~

Article 210.19, Conductors - Minimum Ampacity and Size, paragraph (A)Branch Circuits Not More Than 600 Volts, (1)General, (a) is amended as follows, all other code text remains as is:

210.19 Conductors - Minimum Ampacity and Size.

(a) Where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the minimum branch-circuit conductor size shall have an ~~allowable~~ ampacity not less than the noncontinuous load plus 125 percent of the continuous load in accordance with 310.14. No conductor smaller than 12 AWG copper or 8 AWG aluminum shall be used; however, conductors smaller than 12 AWG copper may be used for taps if part of an approved assembly.

Article 210.52, Dwelling Unit Receptacle Outlets, paragraph (B)(1) and its Exception No. 2 are amended as follows, all other code text remains as is:

(B) Small Appliances.

(1) Receptacle Outlets Served. In the kitchen, pantry, breakfast room, dining room, or similar area of a dwelling unit, the two or more 20-ampere small-appliance branch circuits required by 210.11(C)(1) shall serve all wall and floor receptacle outlets covered by 210.52(A), and all countertop outlets covered by 210.52(C) [~~, and receptacle outlets for refrigeration equipment~~]. Receptacle outlets for refrigeration equipment shall not be connected to the small- appliance branch circuits.

[~~Exception No. 2: In addition to the required receptacles specified by 210.52, a receptacle outlet to serve a specific appliance shall be permitted to be supplied from an individual branch circuit rated 15 amperes or greater.~~]

Article 210.70, Lighting Outlets Required, is amended to include 210.70(D); all other code text remains as is:

210.70 Lighting Outlets Required. Lighting outlets shall be installed where specified in 210.70(A), (B), [~~and~~] (C), and D.

(D) Open Lamps. Lighting outlets required by 210.70(A)(3) and 210.70(C) with open lamps shall be guarded where installed less than seven feet above the working surface measured directly below the lamp or where exposed to physical damage.

Article 215.12, Identification for Feeders, paragraphs (C)(1)(a), (C)(2), (C)(2)(a) and (C)(2)(b) are amended to read as follows:

215.12 Identification for Feeders.

(C) Identification of Ungrounded Conductors. Ungrounded conductors shall be identified in accordance with 215.12(C)(1) or (C)(2), as applicable.

(1) Feeders Supplied from More Than One Nominal Voltage System. Where the premises wiring system has feeders supplied from more than one nominal voltage system, each ungrounded conductor of a feeder shall be identified by phase or line and system at all termination, connection, and splice points in compliance with 215.12(C)(1)(a) and (b).

(a). *Means of Identification.* Feeders shall be color coded in accordance with Article 210.5(C)(1)(a). [~~The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means~~.]

(2) Feeders Supplied From Direct-Current Systems. Where a feeder is supplied from a dc system operating at more than 60 volts, each ungrounded conductor of 8 [~~4~~] AWG or larger shall be identified by polarity at all termination, connection, and splice points by marking tape, tagging, or other approved means; each ungrounded conductor 10 [~~6~~] AWG or smaller shall be identified by polarity at all termination, connection, and splice points in compliance with 215.12(C)(2)(a) and (b). The identification methods utilized for conductors originating within each feeder panelboard or similar feeder distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each feeder panelboard or similar feeder distribution equipment.

(a). *Positive Polarity, sizes 10 [~~6~~] AWG or Smaller.* Where the positive polarity of a dc system does not serve as the connection for the grounded conductor, each positive ungrounded conductor shall be identified by one of the following means:

* * * * *

(b). *Negative Polarity, sizes 10 [~~6~~] AWG or Smaller.* Where the negative polarity of a dc system does not serve as the connection for the grounded conductor, each negative ungrounded conductor shall be identified by one of the following means:

* * * * *

Article 220.14, Other Loads - All Occupancies, paragraph J is amended as follows, all other code text remains as is:

220.14 Other Loads - All Occupancies.

(J) Dwelling ~~Occupancies~~Units. In one-family, two-family, and multifamily dwellings, the minimum unit load shall be not less than 33 volt-amperes/m^2 (3 volt-amperes /ft^2). The lighting and receptacle ~~and in guest rooms or guest suites of hotels and motels, the~~ outlets specified in 220.14(J)(1), (J)(2), and (J)(3) are included in the minimum unit ~~general lighting~~ load ~~calculations of 220.12~~. No additional load calculations shall be required for such outlets. The minimum lighting load shall be determined using the minimum unit load and the floor area as determined in 220.11 for dwelling occupancies. Motors rated less than 1/8 hp and connected to a lighting circuit shall be considered part of the minimum lighting load. A maximum load of 1440 VA, consisting of receptacles at 180 VA each plus luminaires at their maximum allowed lamp wattage shall be permitted on a 15 A branch circuit and a maximum load of 1920 VA, consisting of receptacles at 180 VA each plus luminaires at their maximum allowed lamp wattage shall be permitted on a 20 A branch circuit. When using the optional VA method in lieu of the total number of outlets described in the previous sentence, the VA load shall be computed in accordance 210.20(A) - receptacles at 100% plus luminaires at 125%.

(1) All general-use receptacle outlets of 20-ampere rating or less, including receptacles connected to the circuits in 210.11(C)(3) and 210.11(C)(4)

(2) The receptacle outlets specified in 210.52(E) and (G)

(3) The lighting outlets specified in 210.70(A) and (B)

Article 230.2, Number of Services, paragraph F is added as follows, all other code text remains as is:

230.2 Number of Services. A building or other structure served shall be supplied by only one service unless permitted in 230.2(A) through (D). For the purpose of 230.40, Exception No. 2 only, underground sets of conductors, 1/0 AWG and larger, running to the same location and connected together at their supply end but not connected together at their load end shall be considered to be supplying one service.

(F) Color Coding. Service entrance conductors shall be color coded in accordance with Article 210.5(C)(1)(a).

~~*Article 230.30, Installation, paragraph B is amended as follows, all other code text remains as is:*~~

~~**230.30 Installation.**~~

~~**(B) Wiring Methods.** Underground service 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 as modified below:~~

~~(1) Type RMC conduit~~

~~(2) Type IMC conduit~~

~~(3) Type NUCC conduit - encased in concrete~~

~~(4) Type HDPE conduit - encased in concrete~~

~~(5) Type PVC conduit - encased in concrete~~

~~(6) Type RTRC conduit - encased in concrete~~

~~[(7) Type IGS cable]~~

~~[(8) Type USE conductors or cables]~~

~~[(9) Type MV or Type MC cable identified for direct burial applications]~~

~~(7) [(10)] Type MI cable, where suitably protected against physical damage and corrosive conditions.~~

~~Where encasement is required above, it shall be a minimum 75 mm (3 in.) thick concrete envelope.~~

~~*Article 230.43, Wiring Methods for 1000 Volts, Nominal, or Less, is amended as follows:*~~

~~**230.43 Wiring Methods for 1000 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 as modified below:~~

~~[(1) Open wiring on insulators]~~

~~[(2) Type IGS cable]~~

~~(1) [(3)] Rigid metal conduit (RMC)~~

~~(2) [(4)] Intermediate metal conduit (IMC)~~

~~(3) [(5)] Electrical metallic tubing (EMT)~~

~~[(6) Electrical nonmetallic tubing]~~

~~[(7) Service-entrance cables]~~

~~(4) [(8)] Wireways - metallic construction and lockable only~~

~~(5) [(9)] Busways~~

~~(6) [(10)] Auxiliary gutters - metallic construction only~~

~~(7) [(11)] Rigid polyvinyl chloride conduit (PVC) - encased in concrete~~

~~(8) [(12)] Cablebus~~

~~[(13) Type MC cable]~~

~~(9) [(14)] Mineral-insulated, metal-sheathed cable, Type MI~~

~~[(15) Flexible metal conduit (FMC) not over 1.8 m (6 ft) long or liquidtight flexible metal conduit (LFMC) not over 1.8 m (6 ft) long between a raceway, or between a raceway and service equipment, with a supply-side bonding jumper routed with the flexible metal conduit (FMC) or the liquidtight flexible metal conduit (LFMC) according to the provisions of 250.102(A), (B), (C), and (E)]~~

~~[(16) Liquidtight flexible nonmetallic conduit (LFNC)]~~

~~(10) [(17)] High density polyethylene conduit (HDPE) - encased in concrete~~

~~(11) [(18)] Nonmetallic underground conduit with conductors (NUCC) - encased in concrete~~

~~(12) [(19)] Reinforced thermosetting resin conduit (RTRC) - encased in concrete~~

~~(20) Type TC-ER cable~~

~~Where encasement is required above, it shall a minimum 75 mm (3 in.) thick concrete envelope.~~

Article 240.24, Location in or on Premises, paragraph (D) is amended as follows, all other code text remains as is:

240.24 Location in or on Premises.

(D) Not in Vicinity of Easily Ignitable Material. Newly installed [~~O~~]overcurrent devices shall not be located in the vicinity of easily ignitable material, such as in clothes closets, storage rooms, janitor rooms, and similar. Upgrades permitted in existing location.

Article 250.52, Grounding Electrodes, paragraphs (A)(3)(1) and (A)(5)(b) are amended as follows, all other code text remains as is:

250.52 Grounding Electrodes.

(A) Electrodes Permitted for Grounding.

(3) Concrete-Encased Electrode. A concrete-encased electrode shall consist of at least 6.0 m (20 ft) of either (1) or (2):

(1) One or more bare or zinc galvanized or other electrically conductive coated steel reinforcing bars or rods of not less than 13 mm (1/2 in.) in diameter, installed in one continuous 6.0 m (20 ft) length, or if in multiple pieces connected together by the usual steel tie wires, exothermic welding, welding, or other effective means to create a 6.0 (20 ft) or greater length; or

Informational Note to (A)(3)(1): A piece of reinforcing steel conforming to (1) above which has additional length, without splice, extended up past the sole plate of the structure to which the grounding electrode may be connected to and extended to the service equipment is acceptable. The portion of the reinforcing steel extending above the sole plate shall be painted green and the paint removed from the bar where the connection is made to the grounding electrode conductor.

(5) Rod and Pipe Electrodes. Rod and pipe electrodes shall not be less than 2.44 m (8 ft) in length and shall consist of the following materials.

(b) Rod-type grounding electrodes of stainless steel and copper or zinc coated steel shall be at least 15.87 mm (5/8 in.) in diameter[~~, unless listed~~].

Article 250.118, Types of Equipment Grounding Conductors, the first sentence of Paragraph 118 is amended as follows, all other code text remains as is:

250.118 Types of Equipment Grounding Conductors.

As a minimum, the equipment grounding conductor shall consist of a conductor as described in item (1) as follows and may be supplemented by any of the other means described in items (2) through (14) as follows: [~~The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:~~]

Article 250.119, Identification of Equipment Grounding Conductors, paragraphs (A), (A)(1) and its Exception , and (A)(2)c are amended as follows, all other code text remains as is:

250.119 Identification of Equipment Grounding Conductors.

(A) Conductors 8[4] AWG and Larger. Equipment grounding conductors 8 [~~4~~] AWG and larger shall comply with 250.119(A)(1) and (A)(2).

(1) An insulated or covered conductor 8 [~~4~~] AWG and larger shall be permitted, at the time of installation, to be permanently identified as an equipment grounding conductor at each end and at every point where the conductor is accessible.

Exception: Conductors 8 [~~4~~] AWG and larger shall not be required to be marked in conduit bodies that contain no splices or unused hubs.

(2) Identification shall encircle the conductor and shall be accomplished by one of the following:

c. Marking the insulation or covering with green tape, a minimum of two-inches in length, or green adhesive labels at the termination

~~*Article 300.5, Underground Installations, (D)(3) is deleted as follows, all other code text remains as is:*~~

~~[(3) Service Conductors. Underground service conductors that are not encased in concrete and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation.]~~

Article 314.19, Boxes Enclosing Flush Devices or Flush Equipment, is amended as follows:

314.19 Boxes Enclosing Flush Devices or Flush Equipment. Boxes used to enclose flush devices or flush equipment shall be of such design that the devices or equipment will be completely enclosed on the back and sides, and substantial support for the devices or equipment will be provided. Screws for supporting the box shall not also be used to attach a device or equipment. Boxes for flush devices or equipment shall have a minimum volume of 221 cm^3 (13.5 $in.^3$).

~~*ARTICLE 320 ,Armored Cable: Type AC, is repealed.*~~

~~*ARTICLE 326.10, Uses Permitted, paragraphs (1) and (3) are amended as follows, all other code text remains as is:*~~

~~**326.10 Use Permitted.** Type IGS cable shall be permitted for use underground, including direct burial in the earth, as the following:~~

~~[(1) Service-entrance conductors]~~

~~(1) [(2)] Feeder or branch-circuit conductors~~

~~[(3) Service conductors, underground]~~

ARTICLE 330.6, Listing Requirements, is amended as follows:

330.6 Listings Requirements. Type MC cable shall be listed. Fittings used for connecting type MC cable to boxes, cabinets, or other equipment shall be listed and identified for such use. Additionally, all fittings shall be equipped with an anti-shorting bushing.

~~*ARTICLE 330.10, Uses Permitted, paragraphs (A)(1) and (B)(3) are amended as follows, all other code text remains as is:*~~

~~**330.10 Uses Permitted.**~~

~~**(A) General Uses.** Type MC cable shall be permitted as follows:~~

~~(1) For [services,] feeders and branch circuits.~~

~~**(B) Specific Uses.** Type MC cable shall be permitted to be installed in compliance with Parts II and III of Article 725 and 770.133 as applicable and in accordance with 330.10(B)(1) through (B)(4).~~

~~[**(3) Installed as Service-Entrance Cable.** Type MC cable installed as service-entrance cable shall be permitted in accordance with 230.43.]~~

~~*Article 330.104, Conductors, is amended as follows:*~~

~~**330.104 Conductors.** Conductors shall be of copper, aluminum, copper-clad aluminum, nickel or nickel-coated copper, solid or stranded. The minimum conductor size shall be 12 [18] AWG copper, nickel or nickel-coated copper, or 8 [12] AWG aluminum or copper-clad aluminum.~~

Article 330.112, Insulation, is amended as follows with all other code provisions (A & B) remaining as is:

330.112 Insulation. Insulated conductors shall comply with 330.112(A) or (B) and shall be color coded per the requirements of this chapter.

Article 330.116, Sheath, is amended as follows:

330.116 Sheath. Metallic covering shall be [one of the following types: smooth metallic sheath, corrugated metallic sheath, or] interlocking metal tape armor. The metallic sheath shall be continuous and close fitting. A nonmagnetic sheath or armor shall be used on single conductor Type MC. Supplemental protection of an outer covering of corrosion-resistant material shall be permitted and shall be required where such protection is needed. The sheath shall not be used as a current-carrying conductor. The cutting of the interlocking metal tape armor shall be performed with an approved rotary cutting tool designed for cutting MC cable.

~~*Article 334.10, Uses Permitted, is amended as follows, all other code text remains as is:*~~

~~**334.10 Uses Permitted.** Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following, except as prohibited in 334.12:~~

~~(1) One- and two- family dwellings and their attached or detached garages, and their storage buildings.~~

~~(2) Multi-family dwellings permitted to be of Types III, IV, and V construction. NM cable shall be limited to the dwelling units and their access corridors.~~

~~[(3) Other structures permitted to be of Types III, IV, and V construction. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.]~~

~~[Informational Note No. 1: Types of building construction and occupancy classifications are defined in NFPA 220-2015, Standard on Types of Building Construction, or the applicable building code, or both.]~~

~~[Informational Note No. 2: See Informative 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.]~~

~~[Informational Note: See 310.15(A)(3) for temperature limitation of conductors.]~~

~~(3) Dwelling units used as Type B Occupancies, limited to churches only, as described in the *International Building Code* (IBC) Section 303.1.2, with an occupant load of less than 50 persons.~~

~~(4) Dwelling units used as Single Station Barber and Beauty Salons which comply with the requirements of the Unified Development Code (UDC) Section 35-399.01.~~

~~(5) Types I and II construction where installed within raceways permitted to be installed in Types I and II construction.~~

~~(6) Home Occupations which comply with the requirements of the Unified Development Code (UDC) section 35-378, excluding those used for medical purposes for the treatment of patients.~~

~~(7) The residential portion of a Live-Work Unit which meets the definition of and complies with the requirements of the *International Building Code* (IBC) Section 419. All conductors in the non-residential portion of the structure shall be installed in an approved non-open wiring method.~~

~~*ARTICLE 338.10, Uses Permitted, paragraph (A) is deleted as follows; All other code text remains as is:*~~

~~**338.10 Uses Permitted.**~~

~~[(A) Service-Entrance Conductors. Service-entrance cable shall be permitted to be used as service-entrance conductors and shall be installed in accordance with 230.6, 230.7, and Parts II, III, and IV of Article 230.]~~

~~*Article 362.20, Size, paragraph (B) is amended as follows; All other code text remains as is:*~~

~~**362.20 Size**~~

~~**(B) Maximum.** ENT larger than metric designator 27 (trade size 1) [63 (trade size 2-1/2)] shall not be used.~~

~~*ARTICLE 394, Concealed Knob-and-Tube Wiring, is repealed.*~~

~~*Article 400.10, Uses Permitted, (A)Uses (2) is amended as follows; All other code text remains as is:*~~

~~**400.10 Uses Permitted.**~~

~~(A) **Uses**. Flexible cords and flexible cables shall be used only for the following:~~

~~(2) Wiring of luminaires (fixtures) when supplied as part of a UL listed luminaires.~~

Article 406.12, Tamper-resistant Receptacles, is amended to include 406.12 (9) and (10); all other code text remains as is:

(9) Public areas of assembly occupancies where children might be present

(10) All areas accessible to patients

Article 408.30, General, is amended as follows:

408.30 General. All panelboards shall have a rating not less than the minimum feeder capacity required for the load calculated in accordance with Part III, IV, or V of Article 220, as applicable. Panelboards containing the 120 Volt branch circuits serving the interior of one- and two-family dwelling units shall be located in the interior of the structure in a readily accessible location ~~for new construction~~.

Article 410.36, Means of Support, (B) Suspended Ceilings is amended as follows; All other code text remains as is:

410.36 Means of Support.

(B) Framing members of suspended ceilings systems used to support luminaires shall be securely fastened to each other and shall be securely attached to the building structure at appropriate intervals. Luminaires shall be securely fastened to the ceiling framing member by mechanical means such as bolts, screws, or rivets. Listed clips identified for use with the type of ceiling framing members(s) and luminaire(s) shall also be permitted. Two independent support wires per luminaire on opposing corners shall be permitted when installed in accordance with 300.11(B).

Article 525.20, Wiring Methods, (B) Single-Conductor is amended as follows; All other code text remains as is:

525.20 Wiring Methods.

(B) Flexible Cords and Single-Conductor Cables. Flexible cords shall be permitted only in sizes 12 AWG or larger and shall contain a separate grounding conductor. A maximum of one 25 foot (7.65 m) extension cord may be connected to each individual receptacle provided as part of the manufacturers listed generator. Single-conductor cable shall be permitted only in sizes 2 AWG or larger.

~~*Article 600.32, Neon Secondary Circuit Wiring, over 1000 Volts, Nominal, paragraph (A)Wiring Methods, (1) Installation and (3)Size are amended as follows; All other code text remains as is:*~~

~~**600.32 Neon Secondary-Circuit Wiring, over 1000 Volts, Nominal.**~~

~~**(A) Wiring Methods.**~~

~~**(3) Size.** Conduit or tubing shall be a minimum of metric designator 12 (trade size 3/8). [16 (trade size 1/2)]~~

Article 604.10, Uses Permitted, Exception No. 1, and Article 604.100, Construction, paragraph (A)(1)Cables are amended as follows; All other code text remains as is:

604.10 Uses Permitted.

Exception No.1: In concealed spaces, one end of tapped cable shall be permitted to extend into hollow walls of manufactured wall systems, with removable panels for access to the wiring system, for direct termination at switch and outlet points.

~~**604.100 Construction.**~~

~~**(A) Cable or Conduit Types.**~~

~~**(1) Cables.** Only type MC cables conforming to item (2), below are permitted. [Cables shall be one of the following:]~~

Article 680.23, Underwater Luminaires, (A)General (4) is amended as follows; All other code text remains as is:

680.23 Underwater Luminaires.

(A) General.

(4) Voltage Limitation. No luminaires shall be installed for operation on supply circuits over 150 volts between conductors and the limits are 15 volts ac or 30 volts dc at the luminaire.

Sec. 10-53. - Electrical provisions.

(a) General. The provisions of this section shall apply to the design, construction, installation, use and maintenance of electrical systems and equipment. Where differences occur between provisions of this Code and referenced codes or standards, the provisions of this Code shall apply.

(b) Equipment and door labeling. The disconnecting means for each service, feeder or branch circuit originating in a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident to the code official. Doors into electrical panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording.

(c) TOPS (Temporary on Permanent Set) permit. The section outlines the requirements for obtaining a permit to allow the connection of the new or existing electrical service to CPS Energy prior to having all final inspections completed on a project. The issuance of a TOPS permit and the subsequent connection to the utility company service does not allow an owner or the occupants to occupy the building or structure until a C of O has been issued. The above permit does not waive any of the applicable provisions of articles IV and VIII.

(1) **Sec. 10-1302.3.1 Permit Application.** A licensed electrical contractor registered with the city must make the application for the TOPS permit. The electrical contractor must also request that the TOPS permit be attached to the main building permit in the city's computer system. The TOPS permit is required in addition to the main electrical permit for the project.

(2) The following are the general conditions for obtaining a TOPS permit for new construction and may be modified by the code official to suit project specific conditions:

a. The electrical service must be complete along with all grounding requirements, and the electrical conductors originating from the service equipment must be terminated in an approved electrical manner.

b. The building permit on residential construction shall have an approved foundation and complete frame inspection. The building permit on commercial construction shall have a complete foundation and at minimum a partial frame inspection.

c. On residential construction all trade permits must have approved rough-ins and a complete plumbing top out. On commercial construction all trade permits must have a minimum of a partial rough in including a partial plumbing top out.

d. The plumbing sewer permit shall have an approved final inspection on both commercial and residential.

(3) **Existing construction.** The following are the general conditions for obtaining a TOPS permit for existing construction and may be modified by the code official to suit project specific conditions:

a. The electrical service must be in good condition and comply with the city electrical code including all grounding requirements.

b. The electrical loads originating from the existing service equipment, that will not be utilized for construction power, must be disconnected and safeguarded from accidental contact with an energized electric bus bar.

c. Temporary GFCI protected outlets must be provided at the service equipment location to be used during construction related activities.

d. All necessary and or required trade permits must be obtained prior to giving a final approval to CPS to energize the service equipment.

(d) Electrified fences or barriers. Electrified fences or barriers conforming to the following requirements shall be permitted:

(1) Electrified fences or barriers shall conform to the requirements of the International Electrotechnical Commission (IEC) Standard IEC 60335-1 - Household and similar electric appliances - Safety - Part 1: General Requirements (Reference number IEC 60335-1:2001+A1:2004(E)) and Standard IEC 60335-2 - Household and similar electric appliances - Safety - Part 2-76: Particular requirements for electric fence energizers (Reference number CEI/IEC 60335-2-76:2002+A1:2006) or Underwriters Laboratories Inc. (UL) Standard number 60335-2. Safety of Household and Similar Electrical Appliances, Part 1: General Requirements have.

(2) Electrified fences or barriers shall be limited to outdoor storage areas only in zoning designations: Commercial (C-2 and C-3), Light Industrial District (L), General Industrial District (I-1) and Heavy Industrial District (I-2). Unless specifically designated in this subsection, electrified fences or barriers shall not be permitted in any zoning district.

(3) The exterior (public side) perimeter of the electrified fence or barrier shall be protected by an additional non-electrified fence or wall and shall be separated by six (6) inches.

(4) The height of the non-electrified fence or wall shall be no less than six (6) feet in height and no more than eight (8) feet in height at its highest point.

(5) The height of the electrified fence or barrier shall be no more than ten (10) feet in height at its highest point measured at existing grade.

(6) Electrified fences or barriers shall be clearly marked with warning signs. The warning signs shall be placed at each entrance to the property on the electrified fence or barrier and a maximum of forty (40) feet on centers thereafter around the entire perimeter of the electrified fence. The warning signs shall be placed above the non-electrified fence or wall and be clearly visible from the ground on both sides of the electrified fence or barrier. The warning signs shall be printed on both sides with the following "WARNING ELECTRIFIED FENCE" and contain the international symbol for an electrical hazard. The wording shall be written in both English and Spanish. In addition each entrance shall have a sign noting: "Electric Barrier registered with the San Antonio Development Services Department - City Code 10-53(e)." These signs will be reflective with a minimum two-inch letter height, minimum stroke of one-half (0.5) inch and with a contrasting background. Arabic numbers and alphabetical letters shall be used.

(7) Electrified fences or barriers may be energized only during the hours when the general public does not have legal access to the protected property.

(8) Electrified fences or barriers shall not be installed within five feet of a sidewalk or public right-of-way. They shall also not be installed within one hundred fifty (150) feet of a property line for a residence, or from a public, private, or parochial school day care facility unless the exterior perimeter non-electrified fence is covered with a solid "see-through" covering (e.g., solid mesh, slats, etc.) to further prevent contact with the electrified fence and meets the City's traffic clear vision requirements for intended site.

(9) Electrified fences or barriers must be designed and certified by an authorized representative of the fence or barrier equipment manufacturer. Upon completion of fence or barrier installation, the fence or barrier equipment manufacturer shall certify that the installation meets all of its design and safety requirements.

(10) Electrified fences or barriers must be permitted with the development services department and on an annual basis with a notarized statement attached to the renewal permit from an authorized representative of the fence or barrier equipment manufacturer that the installation is currently operating in conformity with its safety requirements.

(11) The owner of the stated security equipment and the commercial property owner(s) are required to carry general liability insurance in a minimum amount of one million dollars ($1,000,000.00) in the aggregate each. Further, proof of insurance shall be required as a condition precedent to secure a permit as required in this subsection and upon each subsequent annual renewal. A failure to maintain proof of insurance for the permitted year shall result in a revocation of the issued permit. Proof of minimum coverage amounts maintained for the preceding year must be provided with each application for renewal. Failure to maintain coverage for the entire previous year shall result in a denial of any permit renewal for five (5) years from the date of expiration or revocation. Proof of insurance shall be underwritten by an organization licensed/authorized to do business in the state.

(12) A permit holder's decision to appeal acts to modify the provisions of section 10-14(b), Limitations of authority contained in this chapter and does not require acquiescence of the *Building Official* to appeal his decision. Procedures outlined in section 10-14 of this chapter shall be followed unless specifically modified herein. The *Building Official* shall be authorized to revoke a permit upon the recommendation of the chief of police or designee, itself based on and supported by evidence of violation of this chapter. The *Building* ~~*Official* or~~*Official* or designee must send a notice of revocation to the last known address of the permit holder with such notice detailing a time of no more than 10 working days to appeal the *Building Official* 's decision. Notice of appeal

must be sent as soon as practical, but no later than 10 working days past the revocation. The *Building Official*'s decision shall be final upon the expiration of the 10 working day period. A filed appeal shall suspend the *Building Official*'s action to revoke the permit. A permit holder shall be entitled to a hearing before the next reasonably available meeting of the building-related and fire codes appeals and advisory board and it shall either affirm or deny the *Building Official*'s decision. The board's decision shall be based on the same evidence reviewed by the *Building Official* and any subsequent information produced.

(13) Electrified fences or barriers shall have a Knox box installed in a location acceptable to the police and fire departments to de-energize the electrified fence or barrier. The Knox box shall be illuminated to a minimum one foot candle.

(14) The power source and Knox box for the electrified fence or barrier shall be installed by an electrical contractor. The power source shall consist of, but not be limited to, the energizer, battery, a means of maintaining a charge on the battery and the load side conductors from the energizer to the perimeter fence conductors.

(e) Electrical inspections supervisor. The electrical inspections supervisor of the development services department shall also serve as the master of record for electrical work performed by city electricians.

Sec. 10-54. - Fee schedule.

Electrical License and Registration Fees	
Master	
Renewal—City license (two-year renewal)	$300.00
DBA change on master electrical license	$20.00
Journeyman—Renewal of city license (two-year renewal)	$200.00
Maintenance technician—Annual (may only perform work not requiring a permit)	$35.00
Electrical Inspection Fee	
Electrical inspection permit fee (basic fee). See section 10-39 for new residential construction electrical inspection fee.	$50.00
Service rating:	
0—200 amps	$3.25
201—600 amps	$6.50
601—1000 amps	$8.65
1001—2500 amps	$10.80
Over 2500 amps	$12.50
Temporary meter loop (TML). See section 10-39 for new temporary meter loop fee.	$2.15

Temporary on permanent sets (TOPS). See section 10-39 for temporary on permanent sets fee.	$2.15
Work with CPS	$2.15
Gear items	
Switchboards up to four handles	$10.25
Switchboards each additional handle	$1.60
Panelboards/loadcenters	$4.85
Xmfr 1—50 kva	$4.30
Xmfr over 50 kva	$9.70
Safety switch or circuit breaker 30 amps and over	$1.10
Miscellaneous items	
Underground work per 100 linear ft	$1.60
Outside overhead work per 100 linear ft	$1.60
Foundation/concrete encased electrode	$1.60
Controls/low voltage systems over 50 volts	$1.60
Commercial/industrial repair	$9.75
Light fixtures	
HID fixtures	$1.60
Ceiling fans	$1.60
Fluorescent fixtures/ballast retrofits	$.16
Sign circuit	$1.10
General purpose outlets/devices/equipment less than one hp	$.16
Dedicated equipment/appliance outlets 20 amps and over	$1.50
Motors	
1—7.5 hp	$2.15
7.5—25 hp	$3.25
25—50 hp	$8.10

Over 50 hp	$10.80
UPS/generator/distributed generation/storage batteries	
1—5 kw	$1.60
5—50 kw	$3.25
51—300 kw	$4.85
Over 301 kw	$6.50
Temporary wiring	
Power/lights (per every ten outlets)	$3.25
Festival booths	$5.00
Carnival rides	$5.00
Special occupancies	
Class 1, 2, or 3, of article 500 (per each circuit)	$1.00
Medical equipment (MRI, X-ray, scanners, etc.) each circuit	$1.00
Miscellaneous electrical permits Reconnect	
Reconnect inspection	$50.00
30-day (cleaning)	$2.15
180-day (leasing)	$12.89
Maintenance permit fee (electric only)	
Basic permit fee	$50.00
Plus per residential apartment unit	$0.21
Plus per 10,000 sq. ft. of commercial space	$7.00
Building-related and Fire Codes Appeals and Advisory Board Fees	
Building-related and Fire Codes Appeal Fee	$155.00
Special Services for Electrical	
After-hour inspection fee (per hour with one-hour minimum)	$100.00
Electrical plan review only (without building plan number)—(per hour with one-hour minimum)	$100.00

Inspection for which no fee is specifically indicated (per hour with one-hour minimum)	$100.00
Inspection schedule fee (free on-line)	$3.00
Permit processing fee	$10.00
Permit extension fee	50% of permit (plus cost of permit)
Re-inspection fee	$51.50
Permit refund fee	$50.00
Open permit review fee	$3.00/permit
Permit amendment fee	$10.00
Link child permit to parent permit fee	$5.00
Contractor number research fee	$10.00
Duplicate copy of city issued electrical license	$10.00
Rental of facility fees: $125.00/hr (daily min. fee of $250.00; max fee of $1,000.00); security personnel—$15.00/hour/staff (with one-hour minimum); DSD staff—$30.00/hour/staff (with one-hour min.); custodian service—$15.00/hour (with two-hour min.)	

Secs. 10-55—10-60. - Reserved.

ARTICLE VII. - MECHANICAL CODE

Sec. 10-61. - Adoption of *International Mechanical Code* (~~2018~~2021).

The ~~2018~~2021 edition of the *International Mechanical Code*, promulgated by the International Code Council, Chapters 2 through 15 is adopted and incorporated in this article by reference as if fully set forth, except as it is amended by the following provisions of section 10-62. Provisions of this article are in addition to the provisions of the *International Mechanical Code*. The following provisions coinciding with the provisions of the *International Mechanical Code* supersede, repeal, or delete, when indicated, the corresponding provisions of the *International Mechanical Code*.

All references within the model codes to any building, electrical, fuel gas, mechanical, plumbing, energy conservation, ~~or~~ existing building, or swimming pool code shall be construed to be a reference to the respective building, electrical, fuel gas, mechanical, plumbing, energy conservation, ~~or~~ existing building, or swimming pool code specifically adopted by reference in Articles II through XIV~~II~~ of this chapter.