

ORDINANCE NO. 20090305-047

AN ORDINANCE REPEALING AND REPLACING ARTICLE 4 OF CHAPTER 25-12 (THE ELECTRICAL CODE) OF THE CITY CODE TO ADOPT THE 2008 NATIONAL ELECTRICAL CODE AND LOCAL AMENDMENTS TO THE ELECTRICAL CODE.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. Article 4 of Chapter 25-12 of the City Code is repealed and replaced with a new Article 4 to read:

ARTICLE 4. ELECTRICAL CODE.

§ 25-12-111 ELECTRICAL CODE.

(A) The National Electrical Code, 2008 edition, published by the National Fire Protection Association (2008 Electrical Code) is adopted and incorporated into this section, including Annex G, with deletions and amendments in Subsections (B) of this section and Sections 25-12-113 (*Local Amendments to the Electrical Code - Administration*) and 25-12-114 (*Local Amendments to the Electrical Code - Technical*).

(B) The following provisions of the 2008 Electrical Code are deleted:

Section 80.2	Section 200.6 (D)	Section 330.24
Section 80.15	Section 210.21(B)(1)	Section 330.30
Section 80.19(C)	Section 210.52(B)(1)	Section 330.40
Section 80.19(D)	Section 230.56	Section 330.80
Section 80.19(E)	Section 230.70(A)(1)	Section 330.104
Section 80.21	Section 250.52(A)(3)	Section 330.112
Section 80.23(B)	Section 300.3(C)	Section 330.116
Section 80.27	Section 300.11(A)	Section 340.10
Section 80.29	Section 310.5	Section 410.10(D)
Section 80.31	Section 310.10	Section 410.36(B)
Section 80.33	Section 310.10—FPN No.2	Section 680.23(A)(4)
Section 80.35	Section 330.12	Section 680.41
Section 110.26(F)(1)(a)	Section 330.2	Table 310.5

(C) The city clerk shall file a copy of the 2008 Electrical Code with the official ordinances of the City.

§ 25-12-112 CITATIONS TO THE ELECTRICAL CODE.

In the City Code, "Electrical Code" means the 2008 Electrical Code adopted by Section 25-12-111 (*Electrical Code*) as amended by Sections 25-12-113 (*Local Amendments to the Electrical Code - Administration*) and 25-12-114 (*Local Amendments to the Electrical Code – Technical*).

§ 25-12-113 LOCAL AMENDMENTS TO THE ELECTRICAL CODE – ADMINISTRATION.

The following provisions are local amendments to Annex G (*Administration and Enforcement*) of the 2008 Electrical Code. Each provision in this section is a substitute for the identically numbered provision deleted by Section 25-12-111(B) (*Electrical Code*) or is an addition to the Electrical Code.

80.2 Definitions.

Agent. A person designated by an electrical contractor to obtain an electric permit on behalf of the electrical contractor. An agent must be employed by the electrical contractor.

Authority Having Jurisdiction. The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

Chief Electrical Inspector. An electrical inspector designated by the building official in accordance with the requirements of Section 80.27 (*Qualified City Inspectors*) to administer the requirements of this Code.

Citation. A citation for violation of the Electrical Code issued by the director or building official under the requirements of City Code Chapter 1-3 (*Citation Program*).

Commercial Building. A building that is not included in the definition of residential building as provided under this section.

Contractor. A person defined as an electrical contractor under Chapter 1305 of the Texas Occupations Code (*Texas Electrical Safety and Licensing Act*).

Electrical Inspector. An electrical inspector authorized by the City under Section 80.27 (*Qualified City Inspectors*) to perform electrical inspections under the requirements of this Code.

Electrical Work: The installing, maintaining, altering, repairing or erecting of any wiring apparatus, conduit, devices, appliances, fixtures or equipment used in connection therewith, whether inside or outside of any building or structure, lot or premises, for which a permit is required under the terms and provisions of this code.

Residential Building. Single-family, two-family, and multi-family dwelling units of five stories or less in height and located in a residential zone.

Subcontractor: A person or company licensed as an electrical contractor who enters into an agreement with another contractor or owner to perform work on an electrical wiring system.

Texas Department of Licensing and Regulation: The department responsible for the administration and enforcement of the follows regulations:

- (1) Chapter 1305 of the Texas Occupation Code (*The Texas Electrical Safety Licensing Act*); and
- (2) 16 Texas Administrative Code, Chapter 73 (*Administrative Rules of the Texas Department of Licensing and Regulation*).

80.15 Electric Board. The Electric Board is established in Chapter 2-1, Article 25 (*Electric Board*) of the City Code.

80.19(C) Issuance of Permits.

- (1) Standard Permits.
 - a. Except as provided in Section 80.36(B) (*Homestead Permit*), the building official may issue an electrical permit only to an electrical contractor who is licensed to supervise the scope of work for which the permit is issued and who is registered with the City. An electrical contractor may designate a maximum of three agents to obtain electric permits on behalf of the contractor under the contractor's license. An electrical contractor shall not designate more than three agents.

- b. The building official shall review the application, plans, specifications, and other data filed by an applicant for a permit. Other departments may review the plans as necessary to verify compliance with applicable laws.
 - c. The building official shall issue a permit to an applicant if the building official finds that the work described in an application for a permit and in the plans, specifications, and other support data filed with the application conform to the requirements of this Code and other applicable laws and ordinances and that the required fees have been paid.
 - d. When the building official issues a permit, the building official shall either endorse the plans and specifications in writing or stamp "REVIEWED" on the plans and specifications. A person shall not change, modify, or alter the reviewed plans and specifications without authorization from the building official. All work regulated by the Electrical Code shall be done in accordance with the reviewed plans.
 - e. All buildings and/or tenant finish outs in excess of 5,000 square feet shall require a drawing stamped by an electrical engineer. Buildings and/or tenant finish outs of less than 5,000 square feet shall require a drawing stamped by a licensed electrical contractor or electrical engineer. Projects employing meter module units shall have signed approval data indicating type and location from Austin Energy Meter Services prior to electrical plan review submittal.
 - f. The building official may issue a permit for the construction of part of an electrical system before the plans and specifications for the entire system have been submitted or approved if adequate information and detailed statements have been filed that comply with the requirements of this Code. The holder of a permit issued under this section shall proceed at the permit holder's own risk, without assurance that the permit for the entire building, structure, or building service will be granted.
- (2) Registration. Each licensed electrical contractor shall register with the City. At the time of registration, an electrical contractor shall designate the name of the master electrician employed by the contractor. Except as otherwise provided in this subsection, an electrical contractor must employ a master electrician at all times. The electrical contractor is not required to employ a master electrician if the electrical contractor is a master electrician.
- (3) Permit Required. Except as specified 80.19 (C) (4), no electrical system regulated by this code shall be installed, altered, repaired, replaced or remodeled unless a

separate electrical permit has been obtained by the building official. An electrical permit shall be required to remove Austin Energy meter seal.

(4) Exempt work.

a. An electrical permit is not required for the following:

- (i) a portable motor or other portable appliance energized by means of a cord or cable having an attachment plug end to be connected to an approved receptacle when the cord or cable is permitted by the Electrical Code;
- (ii) repair or replacement of a fixed motor, transformer or fixed approved appliance of the same type and rating in the same location;
- (iii) temporary decorative lighting;
- (iv) repair or replacement of a current-carrying part of any switch, contactor or control device;
- (v) reinstallation of an attachment plug receptacle, but not an outlet;
- (vi) repair or replacement of an overcurrent device of the required capacity in the same location;
- (vii) repair or replacement of an electrode or transformer of the same size and capacity for a sign or gas tube system;
- (viii) a taping joint;
- (ix) removal of electrical wiring;
- (x) temporary wiring for experimental purposes in a suitable experimental laboratory;
- (xi) the wiring for a temporary theater, motion picture, or television stage set;
- (xii) an electrical device, appliance, apparatus, equipment, or electrical wiring operating at less than 25 volts and not capable of supplying more than 50 watts of energy;

- (xiii) a low-energy power, control and signal circuit of Class II and Class III as defined in this Code;
 - (xiv) the following activities, if performed in connection with the transmission of electrical energy: the installation, alteration, or repair of electrical wiring, apparatus, or equipment; or the generation, transmission, distribution, or metering of electrical energy;
 - (xv) The operation of signals or the transmission of intelligence by a public or private utility in the exercise of its function as a serving utility; or
 - (xvi) The installation of a ground fault circuit-interrupting receptacle.
- b. Work that is exempt from the permit requirements of the Electrical Code must comply with the Electrical Code and other applicable laws.
- (5) Emergency Repair Permits. An applicant for a permit to make emergency electrical repairs on non-exempt work shall:
- a. identify the emergency on the permit application and submit a repair checklist to the building official upon completion; and
 - b. submit an emergency repair checklist submitted to the building official upon completion.

80.19(D) Registered Industrial Plant Program. Electrical work may be performed in a facility operating under the registered industrial plant program authorized by the Building Code, other than a health care facility or public school, without obtaining the City permits required by Subsection (C)(1) of this section if the following conditions are met:

- (1) The work is limited to the repair, modification, or installation of equipment or branch circuits. Work involving sub-panels, panels, Electrical service, or other similar work requires permits issued under Section 80.19 (*Permits and Approvals*).
- (2) The work is performed by an electrical contractor or master electrician employed by the facility, or persons under the direct control of an electrical contractor or master electrician in accordance with Section 80.40 (*Supervision*).
- (3) The work is inspected by a certified inspector who was approved by the City before performing inspections under this program. The inspector must be a master electrician licensed by the Texas Department of Licensing and Regulation or a

person certified as an electrical inspector by the International Code Council or the International Association of Electrical Inspectors.

- (4) The facility shall maintain records on all work performed under this program in accordance with the Building Code. Records must include:
- a. a description of the nature and location of the work;
 - b. the name and license number of each person performing the work; and
 - c. the name of the approved inspector, dates of inspection, results of inspections, and a statement signed by the approved inspector testifying that the finished work complies with all the applicable provisions of this Code.

80.19(E) Permit Fees. The council shall establish permit fees under separate ordinance.

80.19(I) Special Inspections Program. Subject to the requirements of this section, the building official may establish by rule an inspection program for the installation of electrical components in residential and commercial structures within the zoning jurisdiction of the city.

- (1) Residential. For one and two-family dwellings, the special inspection program may include installation of electrical equipment associated with the following:
- a. Installation of HVAC equipment, with or without ductwork, in a building or section of a building that was previously not served by an HVAC system.
 - b. Replacement of a complete existing central heat and air system with or without ductwork.
 - c. Replacement of or the addition to an existing unit of four or more supply or return duct runs.
 - d. Replacement of any existing self contained packaged units.
- (2) Commercial. For commercial units the special inspection program may include emergency electrical repairs requiring a permit on non-exempt work.
- (3) Sampling. Under the special inspection program, the building official shall inspect the electrical work performed for one out of five residential permit applications and one out of ten commercial applications.

80.21 Plan Review Fees. The council shall establish plan review fees under separate ordinance.

80.27 Qualified City Inspectors. This section applies to an inspector who performs inspections under the Electrical Code.

(A) A chief electrical inspector must:

- (1) be an employee of the City;
- (2) maintain a current Texas Department of Licensing Master Electrical License and certification as a residential and commercial electrical inspector under the certification program established by the International Code Council or the International Association of Electrical Inspectors; and
- (3) have at least 10 years of experience as an engineer, contractor, or superintendent of electrical construction, or a combination thereof, with at least five years of experience in a responsible supervisory capacity and five years of experience as an electrical inspector.

(B) An electrical inspector must:

- (1) be an employee of the City;
- (2) have a current Texas Department of Licensing Master Electrical License that was issued at least two years before the date the inspector is hired by the City; and
- (3) have a current certification as a residential and commercial electrical inspector under the certification program established by the International Code, or obtain such certification within two years after the date of hire and maintain the certification thereafter.

80.36 Licenses.

- (A) License Required. Except as provided in Subsection 80.36(D)(*Homestead Permit*), a license is required to perform electrical work that requires an electrical permit. A licensee may have only one active license in effect at a time.
- (B) License Display. A licensee shall be in possession of the licensee's license at all times when performing electrical work requiring an electrical permit and shall

display the license on demand of the building official or owner of the premises or property on which the licensee is working, offering to work, or has worked. A licensee shall present a drivers license or other picture identification to verify identity.

- (C) **Vehicle Display.** All vehicles and trailers used in the performance of electrical work shall be identified in accordance with the requirements of Section 1305.166 (*Display of License*) of the Texas Occupations Code and Section 73.51 (*Electrical Contractor's Responsibilities*) of Title 16 of the Texas Administrative Code. Information displayed shall be:

- (1) printed in letters and numbers that are at least two inches high and in a color that contrasts with the color of the background surface; and
- (2) permanently affixed in conspicuous places on both sides of vehicle and limited to one company.

- (D) **Homestead Permit.**

- (1) Subject to the requirements in subsection (D)(2)-(6), a person who is not licensed to perform electrical work may perform electrical work within a residence owned by the person if the requirements of the following requirements are met:
 - a. the residence is the person's homestead and principal residence;
 - b. the work does not include electrical, mechanical and plumbing work that involves (1) the main electric service; or (2) reclaiming and charging a ducted heating and air-conditioning system containing refrigerant and natural gas plumbing systems;
 - c. the person has not secured a homestead permit for another residence within the prior 24 month period; and
 - d. the person has owned and occupied the property as of January 1 of the tax year in which the person applies for a homestead permit.
- (2) A person must obtain a homestead permit and pay required permit fees before beginning any electrical, mechanical, or plumbing work. A person must apply for a homestead permit in person and must file an affidavit stating that the location at which the work is to be done is the person's homestead.

- (3) A person who has obtained a homestead permit may not allow or cause any person to perform electrical, mechanical, or plumbing work under the permit. The building official may suspend or revoke a homestead permit if work done under the permit is performed by anyone other than the person who obtained the permit.
- (4) A person may not transfer a permit to another person.
- (5) A person performing electrical, mechanical, or plumbing work under a homestead permit shall present a picture identification to verify that the person is authorized to perform work under the homestead permit when requested by the building official or his designee.
- (6) A homestead permit shall not be issued for electrical, mechanical, or plumbing work on a mobile, modular or manufactured home unless the homeowner owns the land on which the mobile, modular or manufactured home is located. A homestead permit shall not be issued if the mobile, modular or manufactured home is located in a mobile home park, mobile home community or other commercial premises.

80.37 Suspension of Registration.

- (A) This section applies to an electrical contractor who holds a license issued by the Texas Department of Licensing and Regulation.
- (B) Except as provided in Subsection (C), if an electrical contractor violates Section 80.39 (*Offenses*) three times within a 12 month period, the building official may, by written notice, return receipt request, suspend the registration of an electrical contractor. The first suspension under this section shall be for six months from the date that a notice of suspension is received. Subsequent suspensions shall be for one year from the date that a notice of suspension is received.
- (C) The building official may suspend the registration of an electrical contractor after each occurrence of the following offenses: Section 80.39 (1)q (tampering with an electric meter to commit theft of service), Section 80.39(1)d (causing injury to person or property), and Section 80.39 (1)t (endangering person or property).
- (D) An action by the building official under this section may be appealed to the Electric Board.

- (E) Enforcement action taken under this section is not an exclusive remedy for a violation.

80.39 Offenses.

- (A) No person, including but not limited to a permittee, licensee, contractor, or subcontractor, shall:
- (1) permit an unlawful or fraudulent use of an electrical permit;
 - (2) perform, or cause to be performed, electrical work that causes injury to a person or property;
 - (3) perform, or cause to be performed, electrical work in violation of the supervision requirements set forth in this Code;
 - (4) perform electrical work for which a license or permit is required without the required license or permit;
 - (5) perform electrical work in violation of restrictions imposed on a restricted license;
 - (6) display, cause, permit to be displayed, or possess an instrument purporting to be a license to perform electrical work that is false, expired, suspended, or altered;
 - (7) fail or refuse to display a license to perform electrical work in response to a request from the building official;
 - (8) lend a license to perform electrical work to, or permit the use of a license to perform electrical work by, a person other than the person to whom the license was issued;
 - (9) employ a person not licensed as a master electrician/contractor, journeyman electrician, or apprentice electrician to perform electrical work that requires an electrical permit and license;
 - (10) request the building official to perform inspections of incomplete work or work that has not been properly reviewed by the permit holder or the designated supervisor, on three or more occurrences in a 12 month period;

- (11) advertise or otherwise represent to the public that the person is a licensed electrician of a particular class or type or that the person is authorized or willing to perform functions or services that may only be performed under this Code by a licensed electrician of a particular class or type, unless the person possesses a license of the required class or type issued under this Code;
 - (12) employ a person to perform electrical work for which the person is not qualified under this Code
 - (13) supervise a person who is performing electrical work for which the person is not qualified under this Code;
 - (14) tamper or interfere with the proper action or registration of an electrical meter to commit theft of service, as that offense is described in the Texas Penal Code;
 - (15) obtain a permit for a business other than the business identified on the permittee's license;
 - (16) perform electrical work under a permit for a business other than the business identified on the permit authorizing the electrical work;
 - (17) perform, or cause to be performed, electrical work in a manner that endangers a person or property;
 - (18) fail to provide notification of the change of a business address provided on the application for a registration on or before the 10th day after the change occurs;
 - (19) refuse to provide picture identification when requested by the building official; or
 - (20) fail to comply with Section 80.36(H) (*Vehicle Display*).
- (B) A person who violates the requirements of this section commits an offense. An offense under this is a Class C misdemeanor, punishable by a fine not to exceed \$500 for each offense. Each day a person commits an offense or remains in violation of a provision of this section is a separate offense.
- (C) Eligibility for license reinstatement is not a defense to prosecution under this section for performing electrical work without a license.

- (D) Proof of a culpable mental state is not required for conviction of an offense under this section.

80.40 Supervision. There shall be at least one licensed journeyman or master electrician on each site requiring an electrical permit. The ratio of master electricians or journeyman electricians to apprentice electricians shall not exceed one master electrician or journeyman electrician to five apprentice electricians. An inspection request shall not be forwarded to the building official unless the permit holder or the designated supervisor has reviewed the work. A signed checklist shall be provided by the contractor for each inspection process and affixed to the structure in a conspicuous location.

80.41 Special Requirements for Installations below Regulatory Flood Datum.

- (A) For the purpose of this section, regulatory flood datum (RFD) means an established plane of reference from which elevations and depth of flooding may be determined for specific locations of the flood plain in with the Building Code.
- (B) A lighting circuit, switch, receptacle, and lighting fixture operating at a maximum of 120 volts to ground may be installed below the RFD if the circuit can be de-energized by automatic operating electrical disconnect equipment. The electrical circuit must be de-energized before water is present on the floor of the affected areas. If any switch, receptacle or lighting fixture is flooded, its particular circuit shall not be re-energized until the circuit and device or any part of the circuit or device have been disassembled and thoroughly checked, cleaned, or replaced and approved for use by the building official.
- (C) Except for a switch, receptacle, and lighting fixture, all other electrical equipment permanently installed below the RFD must be of the submersible type rated by the manufacturer for submergence for not less than 72 hours for a head of water above the equipment to the RFD.
- (D) An electrical wiring system installed below the RFD must be suitable for continuous submergence in water. Only a submersible type splice will be permitted below the RFD. A conduit located below the RFD must be installed so that it will be self-draining if subject to flooding.
- (E) Electrical power equipment and components of elevator systems must be located above the RFD. An automatic type elevator must be provided with a home station located above the RFD to which the elevator will automatically return after use.

- (F) An electrical unit heater installed below the RFD must be capable of being disconnected as outlined in Subsection (A). An electrical control on a gas and oil furnace located below the RFD shall not exceed 120 volts to ground and the control circuits must be automatically de-energized before water is present on the floor of the affected area.
- (G) Sump pumping equipment of any type must be provided with a float operated warning alarm that acts independently of any other float actuating device used to start and stop pumping equipment. A building and structure utilizing sump-pumping equipment must have automatic starting standby electrical generating equipment located above the RFD. The standby generating equipment must be capable of remaining in continuous operation at 125 percent of the anticipated duration of the design flood.
- (H) A control center, privately owned transformer, distribution and main lighting panel, and switchgear, in addition to other stationary equipment, must be located above the RFD. Portable or moveable electrical equipment may be located below the RFD if the equipment can be disconnected by a single plug or socket assembly of the submersible type and rated for not less than 72 hours for the head of water above the assembly to the RFD.
- (I) All components of emergency lighting systems installed below the RFD must be located so that a component of the emergency lighting system is not within reach of personnel working at floor level in the area where an emergency lighting system is used unless the emergency lighting circuits are provided with ground-fault circuit interrupters having a maximum leakage current to ground sensitivity of 5 milliamperes.
- (J) The building official shall ensure that all incoming main city power service equipment, including all metering equipment, is located two feet above the RFD before releasing electrical utilities or issuing a certificate of occupancy.

25-12-114 LOCAL AMENDMENTS TO THE ELECTRICAL CODE- TECHNICAL

The following provisions are local amendments to the 2008 Electrical Code. Each provision in this section is a substitute for the identically numbered provision deleted by Section 25-12-111(B) (*Electrical Code*) or is an addition to the Electrical Code.

110.12(C) Workmanlike Manner Required.

- (1) Electrical equipment, each wiring system, a raceway, exposed run, unexposed run, cabinet, cutout box, and chase shall be installed in a workmanlike manner. Workmanlike installation is required for a residential, commercial, or industrial project regardless of the type of approved wiring method or approved material used.
- (2) In this section, workmanlike manner means that the installation is neat, installed in straight runs using proper supports, and square and plumb with the structure of the building.
- (3) Examples of workmanlike manner include, but are not limited to:
 - a. work that is properly designed and laid out, with supports installed before the installation of a raceway, cable or other wiring method;
 - b. boxes that are installed level; multiple boxes in a wall that are at the same height; plug, telephone, and data outlets in same area that are level in a wall;
 - c. cable that is brought straight into gutters or panel boards spread evenly on unistrut, using individual straps;
 - d. cable that is cut to length to prevent sagging or looping of cable between supports or lighting fixtures; and
 - e. cable that is run level and square to building lines.

110.12(D) Removal of Raceway Systems. All abandoned raceway systems shall be removed and remaining raceway systems shall be supported in accordance with this code when the ceiling grid or support walls are remodeled during the remodeling of a structure.

110.12(E) Removal of abandoned wiring. All abandoned wiring systems, both high voltage and low voltage, shall be removed from all buildings or lease spaces when a building or lease space is being remodeled.

110.26(F)(1)(a) Dedicated Electrical Space. For indoor installations, dedicated electrical space equals the width and depth of the equipment and extends from the floor to a height of 25 feet above the equipment or to the structural ceiling, whichever is lower. Piping, ducts, or equipment that is foreign to the electrical installation shall not be located in this zone.

200.6(D) Color Coding.

(1) Color coding of conductors shall be as follows:

- a. Single phase 120/240 volt wiring systems.
(A) (B) (N)
RED-----BLACK-----WHITE
- b. Three phase four wire 120/208 volt wiring systems.
(A) (B) (C) (N)
RED----BLACK----BLUE---WHITE
- c. Three phase three and four wire 120/240 volt delta wiring systems.
(A) (B) (C) (N)
RED----ORANGE----BLACK--WHITE
- d. 277/480 wye or 480 volt delta wiring systems.
(A) (B) (C) (N)
BROWN----YELLOW-----PURPLE-----GRAY

(2) Color coding of conductors shall be consistent throughout each system.

Exception 1: Branch circuit conductors supplied by 120/208 volt single phase.

Exception 2: Residential Buildings: Color coding of electrical branch circuit conductors is not required.

(3) Color code shall be maintained throughout the metering and service distribution equipment, regardless of the voltage serving the building, if the building:

- a. contains a mix uses;
- b. has no more than four stories of total wood frame multifamily use; and
- c. is a maximum of five stories of five stories in height.

(4) Type NM cable used on branch circuits inside each unit is exempt from the color coding requirements of this subsection.

200.6(F) Additional Requirements for Certain Mixed Use Buildings. In addition to other applicable requirements of this section, a mixed use building that has no more

than four stories of total wood frame multi-family use and is a maximum of five stories in height is subject to the following requirements:

- (1) An approved raceway shall be installed up to the sub-panel located inside each apartment unit.
- (2) Distribution equipment shall be of the modular metering type, as approved by Austin Energy, and shall be located on each floor of the building in dedicated electrical rooms.
- (4) Main disconnects shall be required on the exterior of building. All common area electrical shall be installed in approved raceway system.
- (5) A new or altered commercial building shall be wired using an approved raceway system.

Exception: Non-metallic cable may remain in a commercial building if the structure is a remodel only of a wood frame structure that was converted from an existing residential building to commercial use under a change of use permit. The structure must be two stories or less in height and supplied by a 120-240-volt single-phase electrical service.

- (6) Marking of wire at each termination point shall be approved for size number 8 AWG and larger.

210.21(B)(1) Single Receptacle on an Individual Branch Circuit.

- a. Single receptacles shall be installed on all individual branch circuits of residential and commercial buildings.
- b. A single receptacle installed on an individual branch circuit shall have an ampere rating not less than that of the branch circuit.
- c. All receptacles and switches in commercial buildings shall be rated at 20 ampere minimum.

210.52(B)(1) Appliances in Kitchen Pantry, Breakfast Room, Dining Room, and Similar Areas.

The two or more 20-ampere small appliance branch circuits required by Section 210.11(C)(1) (*Small-Appliance Branch Circuits*) shall serve all receptacle outlets in the kitchen, pantry, breakfast room, dining room, or similar area of a dwelling unit. The

circuits, regardless of whether two or more are used, may not have other outlets. The circuits may not have more than six duplex outlets for each circuit. All plugs and outlets serving kitchen counter tops and islands shall be evenly distributed between the small appliance circuits. Receptacles installed to serve countertop surfaces must be GFCI protected in accordance with 210.8(A)(6) (*Kitchens*). Receptacles located in pantry, breakfast room, dining room and similar areas are required to be on small appliance circuit and protected by arc fault circuit interrupter device. In addition, an individual 20 ampere branch circuit shall be provided for the following: refrigerator, trash compactor, dishwasher, disposal, built-in microwave, vent hood, freezer, washer, dryer, or other fixed appliances. The individual branch circuits shall be provided with single receptacles in accordance with Section 210.21(B)(1) (*Single Receptacle on an Individual Branch Circuit*).

Exception No. 1: Outdoor receptacles.

Exception No. 2: In addition to the receptacles required by Section 210.52 (*Dwelling Unit Receptacle Outlets*), a switched receptacle supplied from a general purpose branch circuit as defined in Section 210.70(A) (*Dwelling Units*), Exception No. 1 is permitted.

Exception No. 3: A receptacle served by a circuit supplying only motor loads.

Exception No. 4: A receptacle installed to provide power for an electrical system or clock timer for a gas range, gas oven, or counter-mounted cooking unit.

Exception No. 5: A receptacle installed solely for the electrical supply to and support of an electrical clock in a kitchen, pantry, breakfast room, dining room, or similar area.

Exception No. 6: Individual branch circuits shall not be required on under-counter refrigerator or microwave outlets located in a guestroom of a hotel.

230.54(H) Identification of conductors at weather head. All service entrance conductors shall be identified within 12 inches of a rain-tight service head.

230.70(A)(1) Readily Accessible Location.

- a. 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.
- b. Disconnecting means shall be accessible to the exterior of the building at all times and shall not be located above the first floor of a multi-level building.
- c. Service disconnecting means of over 1200 amps may be located a maximum of 25 feet from exterior entrance inside a commercial building.

230.56 Means of Identifying Conductor within the Higher Voltage to Ground.

On a 4-wire, delta-connected secondary where the midpoint of one phase winding is grounded to supply lighting and a similar load, the phase conductor having the higher voltage to ground shall be identified by an outer finish that is orange in color or by tagging or other effective means. Such identification shall be placed at each point where a connection is made if the grounded conductor is also present.

When a neutral is present in a 120/240 volt delta system, a delta panel shall be used and the service must be split up in a gutter. A neutral conductor is not allowed in a delta panel.

250.52(A)(3) Concrete Encased Electrode. All new buildings or structures having a concrete footing or foundation shall have a concrete encased electrode as the primary grounding system. The electrode shall comply with all the requirements of Article 250 (*Grounding and Bonding*), including but not limited to the following requirements:

- a. The electrode shall be a minimum of 20 feet of copper conductor and shall not be smaller than #4 AWG or ½ inch reinforcing bar encased in a minimum of 2 inches of concrete located toward the bottom of the beam. A reinforcing bar may be turned upward in an exterior wall, up to a minimum of 8 inches (readily identifiable). Either of the means used shall be sleeved above finished floor. If a reinforcing bar is added, it shall be in close proximity of service disconnecting means. Grounding conductor termination shall be approved and identified for use in non accessible locations and may be enclosed.
- b. Electrode installations for EUD locations shall require a grounding inspection port for grounding the electrode conductor termination. The inspection port enclosure shall be accessible on exterior of building and a minimum of 4" X 4" X 2 ½" and identified as "Ground Port" on the cover of the port.

Foundations poured without inspection are subject to removal of all or part of the foundation to allow for installation or inspection of a concrete encased electrode as necessary.

250.94(4) The intersystem bonding termination shall be mounted on the bottom of the enclosure using nut/bolt and lock washer. Tech screws are prohibited.

250.94(5) Gas piping shall be bonded with a minimum of #6 cu. AWG. The bonding location and termination shall be on the hard pipe closest to the gas meter and on the load side of the gas meter.

300.3(C) Conductors of Different Systems. Feeders or branch circuit conductors of different systems shall not be mixed in a raceway, junction box, pull box, or outlet box. For separate voltage systems, a junction box and pull box shall be permanently identified as follows:

- (1) Emergency systems shall be permanently identified **red** in color.
- (2) 277 and 480-volt systems shall be identified **yellow** in color.
- (3) 240 volt three phase delta systems where the "high leg" to ground is present shall be permanently identified **orange** in color.
- (4) Branch circuit numbers and ~~their~~ panel originations shall be plainly identified on the cover of every junction box and outlet in a commercial building.

300.4(A)(3) Protection from physical damage. Type NM cable shall be strapped and looped around outlet boxes to provide the required 1-1/4 inch clearance to the face of a stud. In no case shall type NM cable be run behind an outlet box.

300.11(A) Secured in place.

- (1) Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place and supported by the building structure or framing members.
- (2) Cables, raceways and boxes shall not be connected to the ceiling grid support system under any circumstance.
- (3) Separate wires shall be installed to provide support for short runs of conduit or flexible wiring system. Support wires shall be attached to the building

structure and secured at both ends. All support wires shall be identified by use of listed clips, or other readily identifiable means.

- (4) Cable tie wraps may be used to support a fixture whip only if the fixture is suspended below the ceiling on a jack chain or all thread rod

310.5 Minimum Size of Conductors. Solid and stranded conductors may not be smaller than No. 12 copper or No. 6 aluminum or copper-clad aluminum.

Exception No. 1: For flexible cords, as permitted by Section 400.12 (*Minimum Size*).

Exception No. 2: For fixture wire, as permitted by Section 402.6 (*Minimum Size*).

Exception No. 3: For motors rated 1 hp or less, as permitted by Section 430.22(F) (*Separate Terminal Enclosure*).

Exception No. 4: For cranes and hoists, as permitted by Section 610.14 (*Rating and Size of Conductors*).

Exception No. 5: For elevator control and signaling circuits, as permitted by Section 620.12 (*Minimum Size of Conductors*).

Exception No. 6: For Class 1, Class 2, and Class 3 circuits, as permitted by Sections 725.27(A) (*Sizes and Use*), and 725.51, Exception (*Wiring Methods on Supply Side of the Class 2 or Class 3 Power Source*).

Exception No. 7: For fire alarm circuits, as permitted by Sections 760.27(A) (*Sizes and Use*), 760.51, Exception (*Wiring Methods on Supply side of the PLFA Power Source*), and 760.82(B) (*Conductor Size*).

Exception No. 8: For motor-control circuits, as permitted by Section 430.72 (*Overcurrent Protection*).

Exception No. 9: For control and instrumentation circuits, as permitted by Section 727.6 (*Construction*).

Exception No. 10: For electrical signs and outline lighting, as permitted in Sections 600.31(B) (*Insulation and Size*) and 600.32(B) (*Insulation and Size*).

Sec. 330.2 Definition. Metal Clad Cable, Type MC. Type MC cable is a factory assembly of one or more insulated circuit conductors with or without optical fiber members enclosed in an armor of interlocking metal tape.

Sec. 330.3 Other Articles. Type MC cable is permitted for a system that not in excess of 600 volts, nominal, in accordance with Section 300.2(A) (*Voltage*). Type MC cable shall comply with this article and with the applicable provisions of other articles in this Code, including Article 300 (*Wiring Methods*).

Sec. 330.10 Uses Permitted. Unless specifically prohibited elsewhere in this Code, Type MC cable is permitted as follows:

- (A) for branch circuits;
- (B) for power, lighting, control, and signal circuits;
- (C) indoors or outdoors;
- (D) where exposed or concealed;
- (E) direct buried where identified for such use;
- (F) in a cable tray;
- (G) in any raceway;
- (H) as open runs of cable in a ceiling;
- (I) as aerial cable on a messenger;
- (J) in hazardous (classified) locations as permitted in Articles 501 (*Class I Locations*), 502 (*Class II Locations*), 503 (*Class III Locations*), 504 (*Intrinsically Safe Systems*), and 505 (*Class I, Zone 0, 1, and 2 Locations*); and
- (K) in dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations; and
- (L) in wet locations if:
 - (1) the metallic covering is impervious to moisture;

- (2) a lead sheath or moisture-impervious jacket is provided under the metal covering; or
- (3) the insulate conductors under the metallic covering are listed for use in wet locations.

330.12 Uses Not Permitted. Type MC cable shall not be used if the cable will be subject to physical damage. Type MC cable shall not be used where exposed to destructive corrosive conditions, such as direct burial in the earth, in concrete, or where exposed to cinder fills, strong chlorides, caustic alkalis, or vapors of chlorine or hydrochloric acids, unless the metallic sheath is suitable for the condition or is protected by material suitable for the condition. Type MC cable shall not be used as a service feeder or branch circuit feeder entering a panel or panel board in commercial buildings.

Exception: Type MC cable may be used as a service feeder or branch circuit feeder entering a panel or panel board in the portion of a mixed use building used for permanent residential use.

330.24 Bending Radius. A bend shall be made so that the cable will not be damaged, and the radius of the curve of the inner edge of any bend shall not be less than prescribed by Subsections (A) and (B).

- (A) **Interlocked-Type Armor or Corrugated Sheath.** Seven times the external diameter of the metallic sheath.
- (B) **Shielded Conductors.** Twelve times the overall diameter of one of the individual conductors, or seven times the overall diameter of the multiconductor cable, whichever is greater.

330.30 Installation. Except as otherwise provided in this section, Type MC cable shall be installed in compliance with this section, including Figures 1 through 7, Articles 300 (*Wiring Methods*), 490 (*Equipment, Over 600 Volts, Nominal*), 725 (*Class 1, Class 2, and Class 3 Remote-Control, Signaling, and Power-Limited Circuits*), and Section 770.52 (*Installation of Optical Fibers and Electrical Conductors*). The building official may approve an alternate method of compliance if he determines that the alternate method substantially satisfies the following requirements:

- (A) **Workmanlike manner.** Type MC cable shall be installed in a neat orderly and workmanlike manner. Cable shall not cross other cable, be routed diagonally through a building, or have excess slack. Cable that is installed

vertically, must be plumb with the vertical framing of the structure. Cable that is installed horizontally must be level and parallel with the structure.

- (B) **Supported Cables.** Type MC cable shall be supported and secured at intervals not exceeding 6 feet (1.83m) where concealed, 3 feet (0.915m) where exposed, and within 12 inches (305 mm) of a connection to any panelboard or terminal/junction box. MC cable shall be supported immediately before and after every vertical and horizontal bend and in the middle of every horizontal bend. Except as otherwise provided for a lay-in type fixture, cable containing four or fewer conductors, sized no larger than No. 10 shall be secured within 12 inches (305 mm) of every box, cabinet, fitting, or other cable termination.

Exception: Within 18 inches of a lay-in type fixture that will allow cable to be supported on fixture support wire closest to the connector.

(1) Horizontal Runs.

- a. Cable installed in other than a vertical run through a bored or punched hole in wood or metal framing members, or through a notch in wooden framing members and protected by a steel plate at least 1/16 inch (1.59 mm) thick shall be considered supported and secured where such support does not exceed a 6 foot (1.83 m) interval.
- b. Bundling of cables is limited to three cables for each support ring. If more than three cables are required in an exposed location, the cable shall be racked together and uniformly spaced in parallel runs supported by steel channels. Steel channels shall be designed and UL listed for the application. Cables shall be fastened to the channels with metal cable clamps designed for the particular channel used.
- c. MC feeders, if permitted (including, but not limited to, unit load center feeders, and house panel feeders) shall be neatly supported by kindorf channel, mounted at the ceiling or as high as possible, and protected from physical damage. Kindorf channel shall be suspended from a ceiling in accordance with manufacturing loading recommendation.

- (2) At Terminations. A cable containing four or fewer conductors, sized not larger than No. 10, shall be secured within 12 inches (305 mm) of every box, cabinet, fitting, or other cable termination.
- (3) A clearance of at least 6 inches shall be maintained between Type MC cable and other piping systems.
- (4) Cables shall not be supported by pipes, ducts, ceiling assemblies, light fixtures or the support wires of a light fixture, or above other ceiling utilization equipment not intended for cable support.
- (5) Type MC cable may only be supported by fasteners or clamps that are approved and UL listed for cable support.
- (6) All cables passing through fire-rated assemblies shall be provided with a UL listed fire inhibiting assembly intended for cable penetrations equal to the rating of the wall.
- (C) **Unsupported Cables.** Type MC cable is not be required to be supported and secured where the cable is fished between access points, where concealed in a finished building or structure and supporting is impracticable, or where used in a length not more than 6 feet (1.83 m) from an outlet for a connection within an accessible ceiling to a lighting fixture or equipment.
- (D) **Cable Tray.** Type MC cable installed in cable tray shall comply with Article 392 (*Cable Trays*).
- (E) **Direct Buried.** Direct-buried cable shall comply with Section 300.50 (*Underground Installations*).
- (F) **Installed Outside of Buildings or as Aerial Cable.** Type MC cable installed outside of a building or as aerial cable shall comply with Article 225 (*Outside Branch Circuits and Feeders*) and Section 330.10 (*Uses Permitted*).
- (G) **Through or Parallel to Joists, Studs, or Rafters.** Type MC cable shall comply with Section 300.4 (*Protection Against Physical Damage*) where installed through or parallel to a joist, stud, rafter, or similar wood or metal members.

(H) **In Accessible Attics.** The installation of Type MC cable in an accessible attic or roof space shall also comply with Section 320.23 (*In Accessible Attics*).

(I) **Type MC Conductor Notes.**

- (1) All horizontal type MC feeders (including but not limited to unit load centers feeders, house panel feeders, etc.) shall be neatly supported by kindorf channel. Mounted at ceiling, protected from physical damage, as high as possible, kindorf channel shall be suspended from ceiling per manufacturer loading recommendations. See Section 330.30(B)(1)(c).
- (2) The cable shall be installed in a neat, orderly and workmanlike manner. Cable shall not cross, be routed diagonally through the building or have excess slack. Vertical runs shall be plumb. Horizontal runs must be level and parallel with structure. See Section 330.30(A).
- (3) Where more than three cables are required in an exposed location, they shall be racked together uniformly spaced in parallel runs supported by steel channels. Channels shall be designed and UL listed for the application. Cables shall be fastened to the channels with metal cable clamps designed for the particular channels used. See Section 330.30(B)(1)b.
- (4) A clearance of at least 6 inches shall be maintained between other piping systems. See Section 330.30(B)(2).
- (5) Cables shall not be supported by pipes, ducts, ceiling assemblies, light fixtures or support wires of a light fixture, or above other ceiling utilization equipment not intended for cable support. See Section 330.30(B)(3).
- (6) Cables shall be supported and secured at intervals not exceeding 6'-0" where concealed, 3'-0" where exposed and within 12" on connection to any panelboard or terminal / junction box. Cables shall be supported immediately before and after every vertical and horizontal bend and in the middle of every horizontal bend. See Section 330.30(B).

- (7) Only fasteners or clamps that are approved and UL listed for cable support will be allowed. See Section 330.30(4).
- (8) All cables passing through fire-rated assemblies shall be provided with a UL listed fire inhibiting assembly intended for cable penetrations equal to rating of wall. See Section 330.30(5).
- (9) All deviations from this subsection of Figures 1 through 7 shall be approved in writing by the City of Austin and engineer of record prior to installation. See Section 330.30.
- (10) If an MC cable installation conflicts with this subsection or Figures 1 through 7, approval for the installation must be given by the building official in writing prior to installation. See Section 330.30.
- (11) Type MC cable outer jacket shall only be cut with an approved rotary-type cutting tool that is calibrated monthly to the manufacturer's specifications. Cable shall be cut to length and not coiled, looped, or left hanging slack above a ceiling.
- (12) A connector used with Type MC cable shall be approved for use with Type MC cable and manufactured with anti-short as an integral part of the connector.
- (13) No more than three cables may be bundled in a support ring.
- (14) No more than four Type MC cables may be placed within a junction box or raceway.

330.40 Fittings. Fittings used for connecting Type MC cable to a box, cabinet, or other equipment shall be listed and identified for such use.

330.80 Ampacity. The ampacity of Type MC cable shall be in accordance with Section 310.15 (*Ampacities for Conductors Rated 0-2000 volts*) or Section 310.60 (*Conductors Rated 2001 to 35,000 Volts*).

Exception: The ampacity for Type MC cable installed in cable tray shall be determined in accordance with Section 392.11 (*Ampacity of Cables, Rated 2000 Volts or Less, in Cable Trays*).

FPN: See Section 310.10 (*Temperature Limitation of Conductors*) for temperature of conductors.

330.104 Conductors. A conductor shall be of copper, aluminum, or copper-clad aluminum, solid or stranded.

Color-coding. Type MC cable shall have the proper phase color of conductors throughout the entire length of cable, including the switch leg.

330.112 Insulation.

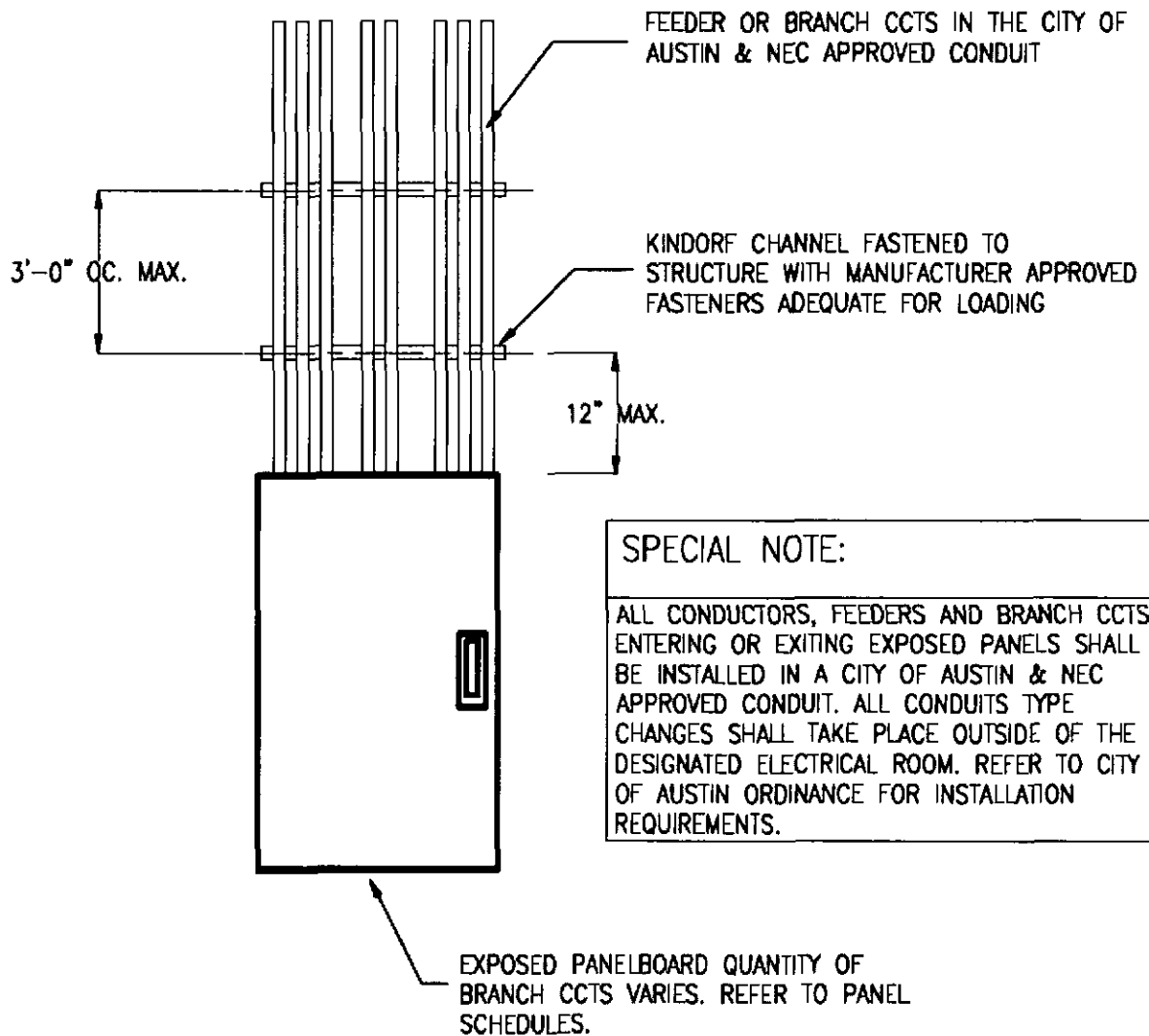
- (a) An insulated conductor for 600 volts or less shall be a minimum of 18 gauge and shall be of a type listed in Table 402.3 (*Fixture Wires*), with a maximum operating temperature not less than 90°C (194°F), and as permitted by Section 725.27 (*Class I Circuit Conductors*). Conductors larger than No. 16 shall be of a type listed in Table 310.13 (*Conductor Application and Insulations*) or of a type identified for use in Type MC cable.
- (b) The minimum conductor size shall be No. 12 copper and No. 6 aluminum or copper-clad aluminum.

330.116 Metallic Sheath. The metallic covering on Type MC cable shall be corrugated metallic sheath. The metallic sheath shall be continuous and close fitting.

Supplemental protection of an outer covering of corrosion-resistant material shall be permitted and is required where protection is necessary. A protective sheath may not be used as a current-carrying conductor.

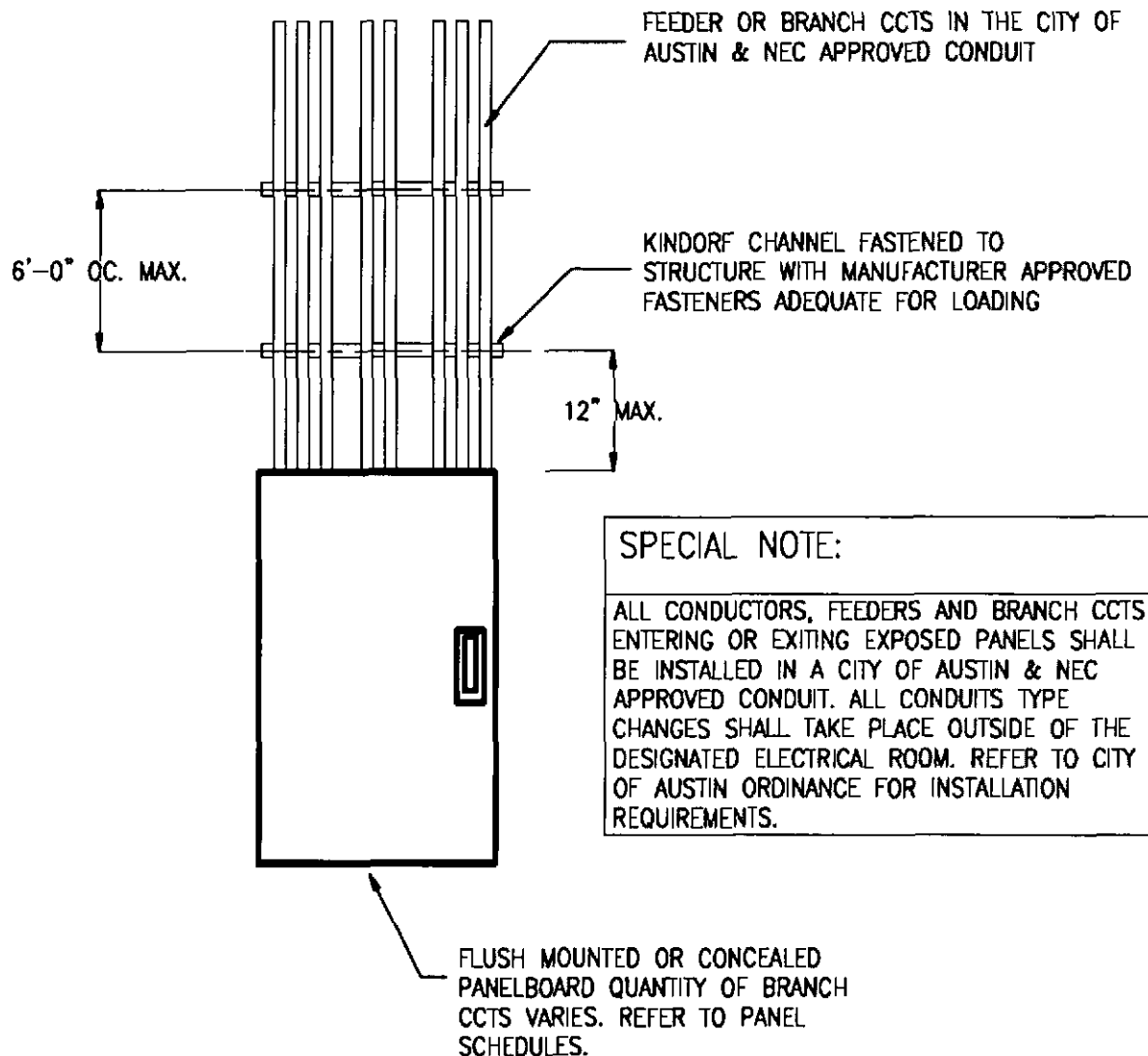
FPN: See Section 300.6 (*Protection Against Corrosion*) for protection against corrosion.

**FIGURE 1 – STRAPPING REQUIREMENTS FOR
COMMERCIAL INSTALLATIONS
EXPOSED PANELBOARD**



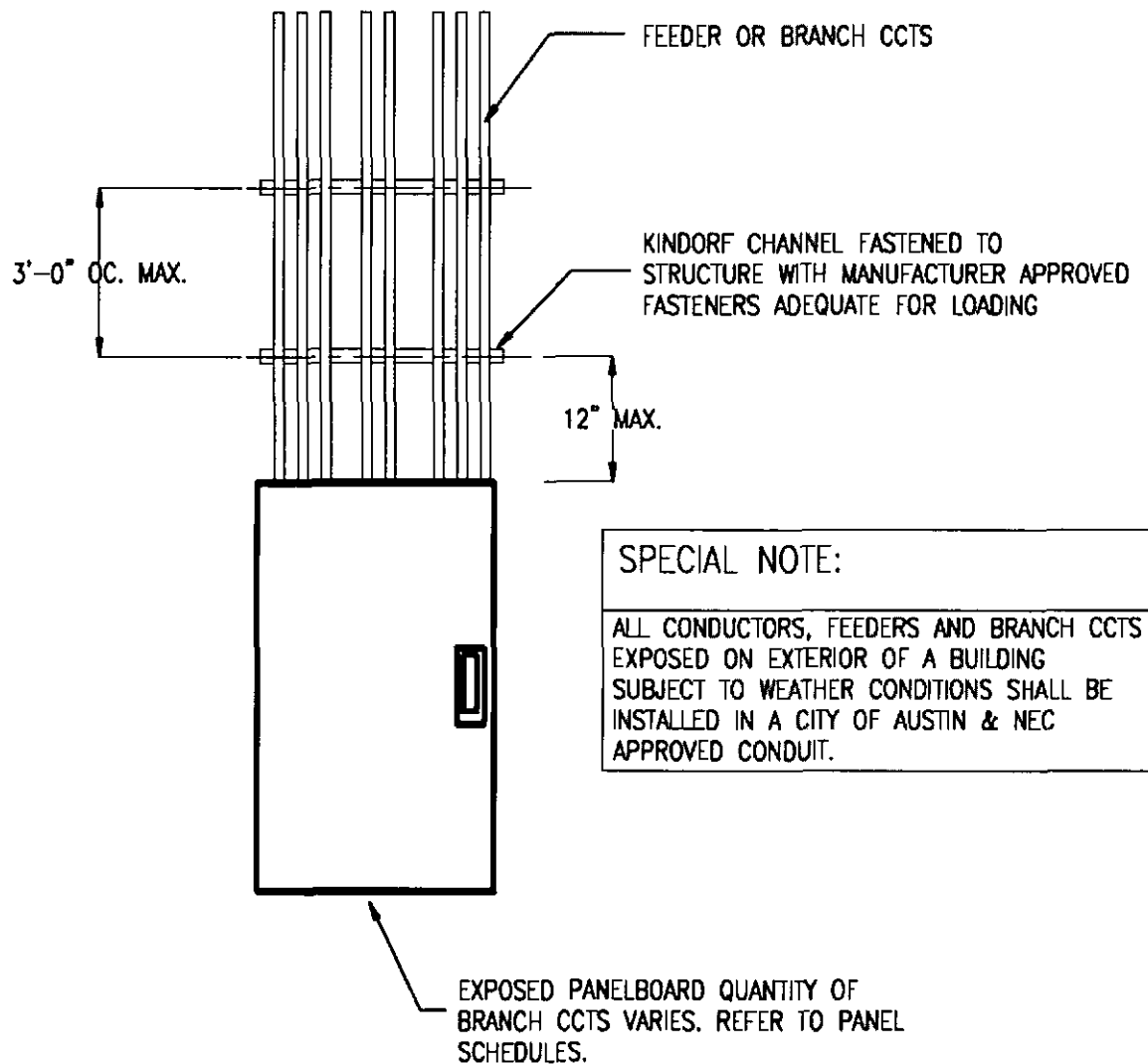
NOT TO SCALE

**FIGURE 2 – STRAPPING REQUIREMENTS FOR
COMMERCIAL INSTALLATIONS
FLUSH MOUNTED OR CONCEALED PANELBOARD**



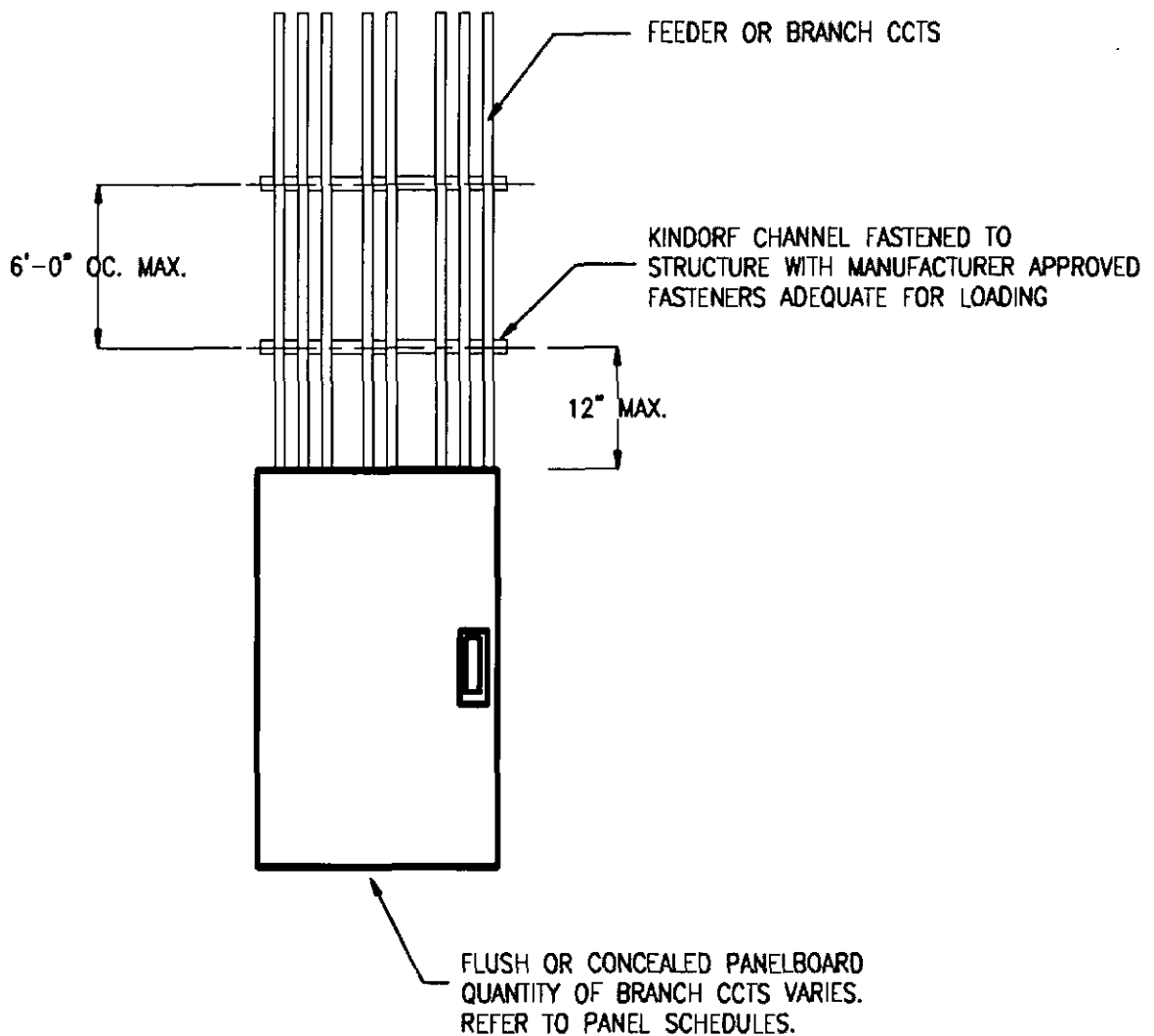
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**FIGURE 3 – STRAPPING REQUIREMENTS AND
PANEL ENTRY/EXIT DETAIL FOR RESIDENTIAL AREAS OF
MIXED-USE INSTALLATIONS
EXPOSED PANEL BOARD**



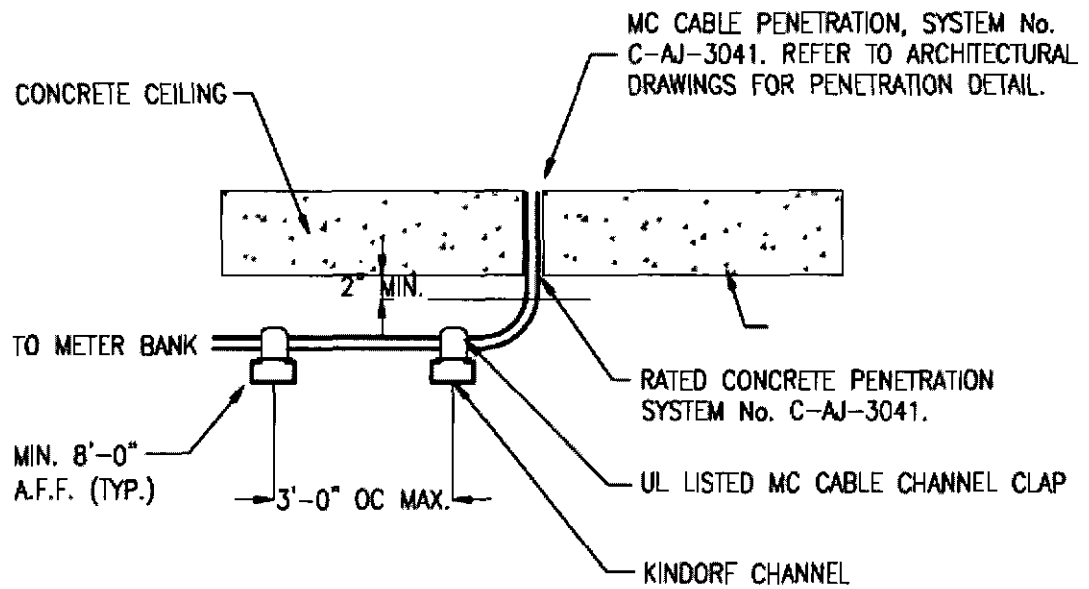
NOT TO SCALE

**FIGURE 4 – STRAPPING REQUIREMENTS AND
PANEL ENTRY/EXIT DETAIL FOR
RESIDENTIAL AREAS OF MIXED-USE INSTALLATIONS
FLUSH OR CONCEALED PANELBOARD**



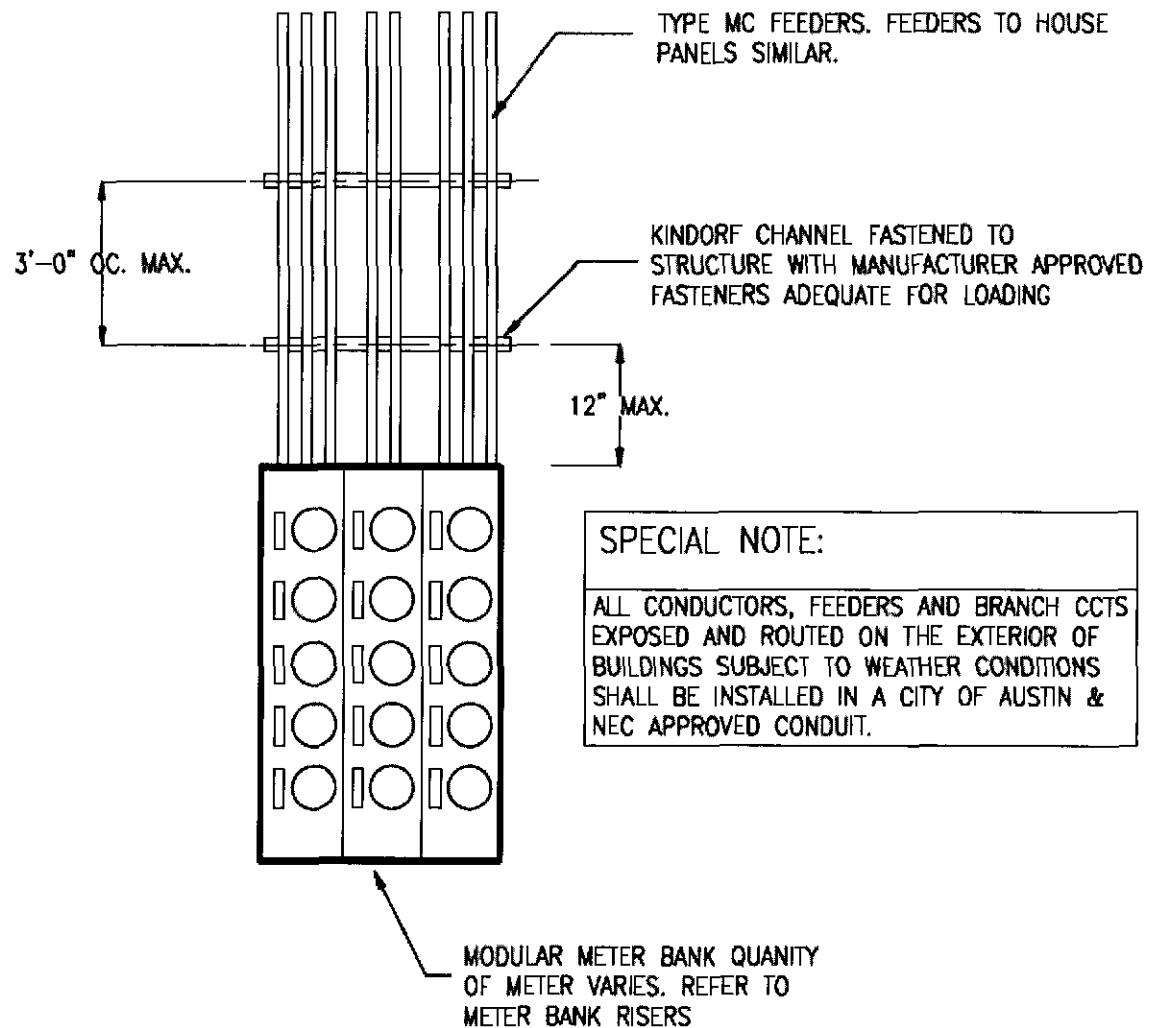
NOT TO SCALE

**FIGURE 5 – RESIDENTIAL & MIXED-USE INSTALLATIONS
FEEDER DETAILS – EXPOSED GARAGE**



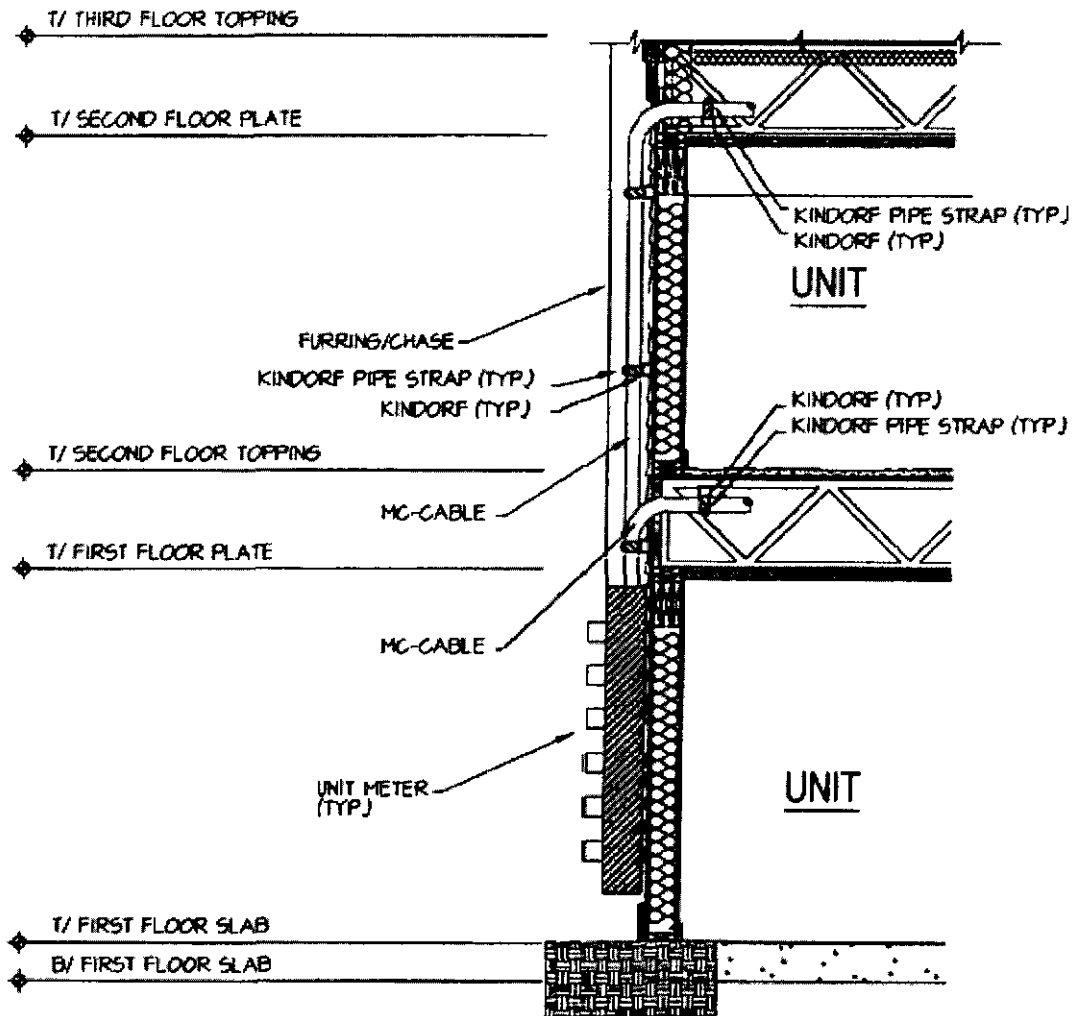
NOT TO SCALE

**FIGURE 6 – MODULAR METER BANK FEEDER DETAIL
FOR RESIDENTIAL AREAS OF
MIXED-USE INSTALLATIONS**



NOT TO SCALE

**FIGURE 7 - RESIDENTIAL AREAS OF
MIXED-USE INSTALLATIONS
DETAIL FOR FEEDERS BETWEEN FLOORS**



NOT TO SCALE

Notes:

1. All vertical and horizontal type MC feeders (including but not limited to unit load center feeders, house panel feeders, etc.) shall be neatly racked and supported at intervals not exceeding 6'-0" (refer to detail).
2. All deviations from detail shall be approved in writing by the City of Austin and engineer of record.

340.10 UF Cable – Uses Permitted. Type UF cable shall be permitted as follows: for use underground, including direct burial in earth, on residential branch circuits 150V to ground 20 amps or less where provided with overcurrent protection of the rated ampacity as required in Section 340.80 (*Ampacity*). Minimum depth shall be as set forth in Table 300.5 (*Minimum Cover Requirements*).

410.10(D) Above Bathtubs. All fixtures, plugs, switches, and parts of cord-connected fixtures, hanging fixtures, lighting track, pendants, or ceiling fans shall not be located within a zone measured 3 feet horizontally and 8 feet vertically from the top of the bathtub rim. This zone is encompassing and includes the zone directly over the tub. Electrical devices must be a minimum of 3 feet horizontally from a shower access.

Exception. Where physical space in the bathroom does not allow the 3 feet spacing, plugs, switches, and lights must be GFI protected.

410.36(B) Suspended Ceiling. Framing members of suspended ceilings shall not be used to support luminaries (fixtures). A fixture shall have two support wires installed catty-corner from each other. Support wire shall be the same gage as the ceiling support wire. Support wire shall be secured at both ends and shall be identified from any other support wires in ceiling. All electrical equipment installed to the suspended ceiling shall require additional support wires. Luminaries in fire rated ceilings shall be supported on all four corners.

680.23(A)(4) Underwater Luminaires (Lighting Fixtures) Voltage Limitation. All underwater lighting systems in pools, spas, hot tubs, fountains and similar installations shall be listed low voltage lighting systems of 16 volt or less.

680.41 Emergency Switch for Pools, Spas and Hot Tubs.

A clearly labeled emergency shutoff switch shall be installed to disconnect all power to pool, spa or hot tub equipment and underwater lighting systems. The switch shall be installed in a place that is readily accessible, within sight, and not less than 1.5m (5 ft) nor more than 15m (50 ft) away from the waters edge.

The sign for the shut-off switch shall be red in color, with letters of clearly contrasting color capable of being easily read at a distance of 50 feet. Sign material shall be plastic, metal or similar durable material. The sign shall read “Emergency Shut Off.”

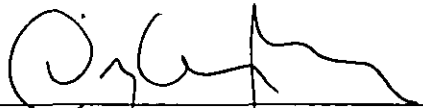
The emergency shut off switch shall be red in color and of the mushroom “push to kill” type as illustrated in Exhibit 680.17 of the 2008 N.E.C. Handbook.

Exception: 1 and 2 family dwellings units.

PART 2. This ordinance takes effect on March 16, 2009.

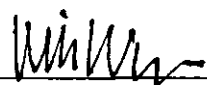
PASSED AND APPROVED


March 5, 2009

APPROVED: 

David Allan Smith
City Attorney

§
§
§


Will Wynn
Mayor

ATTEST: 

Shirley A. Gentry
City Clerk