

**ORDINANCE NO. 9628**

**AN ORDINANCE OF THE CITY OF LAWRENCE, KANSAS, REPEALING EXISTING CHAPTER 5, ARTICLE 4 OF THE CODE OF THE CITY OF LAWRENCE, 2018 EDITION, AND AMENDMENTS THERETO, AND ENACTING, IN ITS PLACE, CHAPTER 5, ARTICLE 4 OF THE CODE OF THE CITY OF LAWRENCE, KANSAS, 2018 EDITION, AND AMENDMENTS THERETO, WHICH ADOPTS AND INCORPORATES BY REFERENCE THE NFPA 70, *NATIONAL ELECTRICAL CODE, 2017 EDITION*, REGULATING BUILDING AND CONSTRUCTION WITHIN THE CITY OF LAWRENCE, KANSAS.**

**BE IT ORDAINED BY THE GOVERNING BODY OF THE CITY OF LAWRENCE, KANSAS:**

**SECTION 1.** Existing Chapter 5, Article 4, of the Code of the City of Lawrence, Kansas, 2018 Edition, and amendments thereto, is hereby repealed in its entirety, it being the intent of the Governing Body that Section 2 of this Ordinance supersede it.

**SECTION 2.** The Code of the City of Lawrence, Kansas, 2018 Edition, and amendments thereto, is hereby amended by enacting Chapter 5, Article 4, which reads as follows:

**ARTICLE 4. ELECTRICAL CODE**

- 5-401      **ELECTRICAL CODE ADOPTED AND INCORPORATED.**  
The NFPA 70, *National Electrical Code, 2017 Edition*, published by the National Fire Protection Association, other than those portions hereinafter specifically deleted, modified, or amended, is hereby adopted as the City's Electrical Code and is incorporated herein by reference as if set forth in full.
- 5-402      **OFFICIAL COPY.**  
Not less than one (1) copy of the NFPA 70, *National Electrical Code, 2017 Edition*, shall be marked or stamped "OFFICIAL COPY AS INCORPORATED BY ORDINANCE No. 9628," with all sections or portions deleted, modified, or amended clearly marked as such, and to which one (1) copy of this ordinance shall be affixed, shall be filed with the City Clerk, shall be open to inspection, and shall be available to the public during reasonable business hours. Additional official copies shall, at the cost of the City, be supplied to those officials and agencies charged with enforcement of the City's Electrical Code.
- 5-403      **AMENDMENTS TO THE NPFA 70, *NATIONAL ELECTRICAL CODE, 2017 EDITION*.**  
The NFPA 70, *National Electrical Code, 2017 Edition*, is amended as set forth in the succeeding sections of this Article. These amendments shall not serve to delete, modify, or amend any discretely numbered section or subsection of the NFPA 70, *National Electrical Code, 2017 Edition*, unless the section or subsection is specifically identified as being deleted, modified, or amended.
- 5-404      **Section 90.2 of the NPFA 70, *National Electrical Code, 2017 Edition*, is hereby amended to read as follows:**

## 90.2 Scope.

**(A) Covered.** This *Code* covers the installation of electrical conductors, equipment, and raceways; signaling and communications conductors, equipment, and raceways; and optical fiber cables and raceways for the following:

- (1) Public and private premises, including buildings, structures, mobile homes, recreational vehicles, and floating buildings.
- (2) Yards, lots, parking lots, carnivals, and industrial substations.
- (3) Installations of conductors and equipment that connect to the supply of electricity.
- (4) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center.

**(B) Not Covered.** This *Code* does not cover the following:

- (1) Installations in ships, watercraft other than floating buildings, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles

Informational Note: Although the scope of this *Code* indicates that the *Code* does not cover installations in ships, portions of this *Code* are incorporated by reference into Title 46, *Code of Federal Regulations*, Parts 110–113.

- (2) Installations underground in mines and self-propelled mobile surface mining machinery and its attendant electrical trailing cable.
- (3) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communications purposes.
- (4) Installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations.
- (5) Installations under the exclusive control of an electric utility where such installations
  - a. Consist of service drops or service laterals, and associated metering, or
  - b. Are one property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, or transmission, or distribution of electrical energy, or

- c. Are located in legally established easements or rights-of-way, or
- d. Are located by other written agreements either designated by or recognized by public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations. These written agreements shall be limited to installations for the purpose of communications, metering, generation, control, transformation, transmission, or distribution of electric energy, ~~where legally established easements or rights-of-way cannot be obtained. These installations shall be limited to federal lands, native American reservations through the U.S. Department of the Interior Bureau of Indian Affairs, military bases, lands controlled by port authorities and state agencies and departments, and lands owned by railroads.~~

Informational Note to (4) and (5): Examples of utilities may include those entities that are typically designated or recognized by governmental law or regulation by public service/utility commissions and that install, operate, and maintain electric supply (such as generation, transmission, or distribution systems) or communication data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

**(C) Special Permission.** The authority having jurisdiction for enforcing this *Code* may grant exception for the installation of conductors and equipment that are not under the exclusive control of the electric utilities and are used to connect the electric utility supply system to the service conductors of the premises served, provided such installations are outside a building or structure, or terminate inside at a readily accessible location nearest the point of entrance of the service conductors.

5-405 **The NPFA 70, *National Electrical Code, 2017 Edition***, is hereby amended by adding Section 100.1, which shall read as follows:

**Basement.** Any story that is not a story above grade plane.

**Story.** That portion of a building between the upper surface of a floor and the upper surface of the floor or roof next above, inclusive. It is measured as the vertical distance from top-to-top of two successive tiers of beams or finished floor surfaces and, for the top-most story, from the top of the floor finish to the top of the ceiling joists or, where there not a ceiling, to the top of the roof rafters.

5-406 **Section 210.8 of the NPFA 70, *National Electrical Code, 2017 Edition***, is hereby amended to read as follows:

**210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.** Ground-fault circuit interrupter protection for personnel shall be provided as required in 210.8 (A) through ~~(E)~~ (D). The ground-fault circuit-interrupter shall be installed in a readily accessible location.

Informational Note No. 1: See 215.9 for ground-fault circuit-interrupter protection for personnel on feeders.

Informational Note No. 2: See 422.5(A) for GFCI requirements for appliances.

For the purposes of this section, when determining distance from receptacles, the distance shall be measured as the shortest path of the cord of the appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, or fixed barrier, or passing through a door, doorway, or window.

**(A) Dwelling Units.** All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through ~~(4)~~ (9) shall have ground-fault circuit-interrupter protection for personnel.

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

Exception to (2): A single receptacle outlet for refrigerators, freezers, garage door openers, and sump pumps located within dedicated space for each appliance that, in normal use, are not easily moved from one place to another and that are cord-and-plug connected shall be permitted to be installed in accordance with 400.7(A)(6), (A)(7), or (A)(8).

- (3) All Outdoors

*Exception to (3): Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, or deicing, ~~or pipeline and vessel heating equipment~~ shall be permitted to be installed in accordance with 426.28 ~~or 427.22~~, as applicable.*

- (4) Crawl spaces – at or below grade level
- (5) Unfinished portions or areas of the basement not intended as habitable rooms

Exception No. 1 to (5): A single receptacle outlet for refrigerators, freezers, garage door openers, and sump pumps located within dedicated space for each appliance that, in normal use, are not easily moved from one place to another and that are cord-and-plug connected shall be permitted to be installed in accordance with 400.7(A)(6), (A)(7), or (A)(8).

*Exception No. 2 to (5): A receptacle supplying only a permanently installed fire alarm or burglar alarm system shall not be required to have ground-fault circuit-interrupter protection.*

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

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

- (6) Kitchens – where the receptacles are installed to serve the countertop surfaces
- (7) Sinks and washing machines – where receptacles are installed within 1.8 m (6 ft) of the outside edge of the sink and tub of the washing machine

*Exception to (7): A single receptacle outlet for appliances located within dedicated space for each appliance that, in normal use, are not easily moved from one place to another and that are cord-and-plug connected shall be permitted to be installed in accordance with 400.7(A)(6), (A)(7), or (A)(8), including microwaves, ovens, ice makers, warming ovens, dryers, washing machines, and garbage disposals.*

- (8) Boathouses
- (9) Bathtubs or shower stalls - where receptacles are installed within 1.8 m (6 ft.) of the outside edge of the bathtub or shower stall
- (10) Laundry areas

**(B) Other Than Dwelling Units.** All single-phase receptacles rated 150 volts to ground or less, 50 amperes or less and three-phase receptacles rated 150 volts to ground or less, 100 amperes or less installed in the following locations shall have a ground-fault circuit-interrupter protection for personnel:

- (1) Bathrooms
- (2) Kitchens
- (3) Rooftops

*Exception: Receptacles on rooftops shall not be required to be readily accessible other than from the rooftop.*

- (4) Outdoors

*Exception No. 1 to (3) and (4): Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, or deicing, or pipeline and vessel heating equipment shall be permitted to be installed in accordance with 426.28 ~~or 427.22~~, as applicable.*

*Exception No. 2 to (4): In industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power is interrupted or having a design that is not compatible with GFCI protection.*

- (5) Sinks — where receptacles are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink

*Exception No 1 to (5): In industrial laboratories, receptacles used to supply equipment where removal of power would introduce a greater hazard shall be permitted to be installed without GFCI protection.*

*Exception No 2 to (5): For receptacles located in patient bed locations of general care or critical care areas of health care facilities other than those covered under 210.8 (B)(1), GFCI protection shall not be required.*

- (6) Indoor wet locations
- (7) Locker rooms with associated showering facilities.
- (8) Garages, service bays, and similar areas other than vehicle exhibition halls and showrooms
- (9) Crawl spaces - at or below grade level
- (10) Unfinished portions or areas of the basement not intended as habitable rooms

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

~~**(D) Kitchen Dishwasher Branch Circuit.** GFCI protection shall be provided for outlets that supply dishwashers installed in dwelling unit locations.~~

~~**(D)**~~**(E) Crawl Space Lighting Outlets.** GFCI protections shall be provided for lighting outlets not exceeding 12.0 volts installed in the crawl spaces.

5-407

**Section 210.12 of the NFPA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**210.12 Arc-Fault Circuit-Interrupter Protection.** Arc-fault circuit-interrupter protection shall be provided as required in 201.12(A), (B), and (C). The arc-fault circuit interrupter shall be installed in a readily accessible location.

**(A) Dwelling Units.** All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets or devices installed in dwelling unit ~~kitchens~~, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreations

rooms, closets, hallways, ~~laundry areas~~, or similar rooms or areas shall be protected by any of the means described in 210.12(A)(1) through (6):

- (1) A listed combination-type arc-fault circuit interrupter installed to provide protection of the entire branch circuit
- (2) A listed branch/feeder type AFCI installed at the origin of the branch-circuit in combination with a listed outlet branch-circuit type arc-fault circuit interrupter installed at the first outlet box on the branch circuit. The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit.
- (3) A listed supplemental arc protection circuit breaker installed at the origin of the branch circuit in combination with a listed outlet branch-circuit type arc-fault circuit interrupter installed at the first outlet box on the branch circuit where all of the following conditions are met:
  - a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit arc-fault circuit interrupter.
  - b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50ft.) for a 14 AWG conductor or 21.3 m (70ft.) for a 12 AWG conductor.
  - c. The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit.
- (4) A listed outlet branch-circuit type arc-fault interrupter installed at the first outlet on the branch circuit in combination with a listed branch-circuit overcurrent protective device where all of the following conditions are met:
  - a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit arc-fault circuit interrupter.
  - b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft.) for a 14 AWG conductor or 21.3 m (70 ft.) for a 12 AWG conductor.
  - c. The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit.

- d. The combination of the branch-circuit overcurrent device and the outlet branch-circuit AFCI shall be identified as meeting the requirements for a system combination-type AFCI and shall be listed as such.
- (5) If RMC, IMC, EMT, Type MC, or steel armored Type AC cables meeting the requirements of 250.118, metal wireways, metal auxiliary gutters, and metal outlet and junction boxes are installed for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed branch-circuit type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.
- (6) Where a listed metal or nonmetallic conduit or tubing or Type MC cable is encased in not less than 50 mm (2 in.) of concrete for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install an outlet branch circuit type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

*Exception No. 1: Where an individual branch circuit to a fire alarm system installed in accordance with 760.41(B) or 760.121(B) is installed in RMC, IMC, EMT, or steel-sheathed cable, Type AC or Type MC, meeting the requirements of 250.118, with metal outlet and junction boxes, AFCI protection shall be permitted to be omitted.*

*Exception No. 2: AFCI protection shall be permitted to be omitted from 120-volt single-station smoke detectors.*

Informational Note No. 1: For information on combination-type and branch/feeder-type arc-fault circuit interrupters, see U.L. 1699-2011, *Standard for Arc-Fault Circuit Interrupters*. For information on outlet branch-circuit type arc-fault circuit interrupters, see U.L. Subject 1699A, *Outline of Investigation for Outlet Branch Circuit Arc-Fault Circuit-Interrupters*. For information on system combination AFCIs, see UL Subject 1699C, *Outlet of Investigation for System Combination Arc-Fault Circuit Interrupters*.

Informational Note No. 2: See 29.6.3(5) of the NFPA 72-2013, *National Fire Alarm and Signaling Code*, for information related to secondary power-supply requirements for smoke alarms installed in dwelling units.

Informational Note No. 3: See 760.41(B) and 760.121 (B) for power-supply requirements for fire alarm systems.

**(B) Dormitory Units.** All 120-volt, single-phase, 15- and 20-ampere branch-circuits supplying outlets and devices installed in dormitory unit bedrooms, living rooms, hallways, closets, bathrooms, and similar rooms shall be protected by any of the means described in 210.12(A)(1) through (6).



**(C) Guest Rooms and Guest Suites.** All 120-volt, single-phase, 15- and 20-ampere branch-circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels shall be protected by any of the means described in 210.12(A)(1) through (6).

**(D) Branch Circuit Extensions or Modifications - Dwelling Units and Dormitory Units.** In any of the areas specified in 210.12(A) or (B), where branch-circuit wiring is modified, replaced, or extended, the branch circuit shall be protected by one of the following:

- (1) A listed combination-type AFCI located at the origin of the branch circuit
- (2) A listed outlet branch circuit type AFCI located at the first receptacle outlet of the existing branch circuit.

*Exception: AFCI protection shall not be required where the extension of the existing conductors is not more than 1.8 m (6 ft.) and does not include any additional outlets or devices.*

5-408

**Section 210.23 of the NFPA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**210.23 Permissible Loads, Multiple-Outlet Branch Circuits.** In no case shall the load exceed the branch-circuit ampere rating. A branch circuit supplying two or more outlets or receptacles shall supply on the loads specified according to its size as specified in 210.23(A) through (D) and as summarized in 210.24 and Table 210.24.

**(A) 15- and 20-Ampere Branch Circuits.** A 15- or 20-ampere branch circuit shall be permitted to supply lighting units or other utilization equipment, or a combination of both, and shall comply with 210.23(A)(1), ~~and (A)(2), and (A)(3).~~

*Exception: The small appliance branch circuits, laundry branch circuits, and bathroom branch circuits required in a dwelling unit(s) by 210.11(C)(1), (C)(2), and (C)(3) shall supply only the receptacle outlets specified in that section.*

- (1) **Cord-and-Plug-Connected Equipment Not Fastened in Place.** The rating of any one cord-and-plug-connected utilization equipment not fastened in place shall not exceed 80 percent of the branch-circuit ampere rating.
- (2) **Utilization Equipment Fastened in Place.** The total rating of utilization equipment fastened in place, other than luminaries, shall not exceed 50 percent of the branch-circuit ampere rating where lighting units, cord-and-plug-connected utilization equipment not fastened in place, or both, are also supplied.
- (3) **Sump pumps.** Sump pumps shall be served by an individual branch circuit. The circuit and its single receptacle outlet shall be in addition to any outlets required by 210.52.

**(B) 30-Ampere Branch Circuits.** A 30-ampere branch circuit shall be permitted to supply fixed lighting units with heavy-duty lampholders in other than a dwelling unit(s) or utilization equipment in any occupancy. A rating of any one cord-and-plug-connected utilization equipment shall not exceed 80 percent of the branch-circuit ampere rating.

**(C) 40- and 50-Ampere Branch Circuits.** A 40- or 50-ampere branch circuit shall be permitted to supply cooking appliances that are fastened in place in any occupancy. In other than dwelling units, such circuits shall be permitted to supply fixed lighting units with heavy-duty lampholders infrared heating units, or other utilization equipment.

**(D) Branch Circuits Larger Than 50 Amperes.** Branch circuits larger than 50 amperes shall supply only nonlighting outlet loads.

5-409

**Section 210.52 of the NFPA 70, *National Electrical Code, 2017 Edition*, is hereby amended to read as follows:**

**210.52 Dwelling Unit Receptacle Outlets.** This section provides requirements for 125-volt, 15- and 20-ampere receptacle outlets. The receptacles required by this section shall be in addition to any receptacle that is:

- (1) Part of a luminaire or appliance, or
- (2) Controlled by a wall switch in accordance with 210.70(A) (1), Exception No. 1, or
- (3) Located within cabinets or cupboards, or
- (4) Located more than 1.7 m (5 1/2 ft) above the floor

Permanently installed electric baseboard heaters equipped with factory-installed receptacle outlets or outlets provided as a separate assembly by the manufacturer shall be permitted as the required outlet or outlets for the wall space utilized by such permanently installed heaters. Such receptacle outlets shall not be connected to the heater circuits.

Informational Note: Listed baseboard heaters include instructions that may not permit their installation below receptacle outlets.

**(A) General Provisions.** In every kitchen, family room, dining room, living room, parlor, library, den, sunroom, bedroom, recreation room, or similar room or area of dwelling units, receptacle outlets shall be installed in accordance with the general provisions specified in 210.52 (A)(1) through (A)(4).

- (1) **Spacing.** Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 1.8 m (6 ft) from a receptacle outlet.
- (2) **Wall Space.** As used in this section, a wall space shall include the following:

- (1) Any space 600 mm (2 ft) or more in width (including space measured around corners) and unbroken along the floor line by doorways and similar openings, fireplaces, and fixed cabinets that do not have countertop or similar work surfaces.
  - (2) The space occupied by fixed panels in exterior walls, excluding sliding panels.
  - (3) The space afforded by fixed room dividers such as freestanding bar-type counters or railings.
- (3) **Floor Receptacles.** Receptacle outlets in or on floors shall not be counted as part of the required number of receptacle outlets unless located within 450 mm (18 in.) of the wall.
- (4) **Countertop and Similar Work Surface Receptacle Outlets.** Receptacles installed for countertop and similar work surfaces as specified in 210.52(C) shall not be considered as the receptacle outlets required by 210.52 (A).

(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), all countertop outlets covered by 210.52(C), and receptacle outlets for refrigeration equipment.

*Exception No. 1: In addition to the required receptacles specified by 210.52, switched receptacles supplied from a general-purpose branch circuit as defined in 210.70(A)(1), Exception No. 1, shall be permitted.*

*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.*

- (2) **No Other Outlets.** The two or more small-appliance branch circuits specified in 210.52(B)(1) shall have no other outlets.

*Exception No. 1: A receptacle installed solely for the electrical supply to and support of an electric clock in any of the rooms specified in 210.52(B)(1).*

*Exception No. 2: Receptacles installed to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter-mounted cooking units.*

(3) **Kitchen Receptacle Requirements.** Receptacles installed in a kitchen to serve countertop surfaces shall be supplied by not fewer than two small-appliance branch circuits, either or both of which shall also be permitted to supply receptacle outlets in the same kitchen and in other rooms specified in 210.52(B)(1). Additional small-appliance branch circuits shall be permitted to supply receptacle outlets in the kitchen and other rooms specified in 210.52(B)(1). No small-appliance branch circuit shall serve more than one kitchen.

(C) **Countertops and Work Surfaces.** In kitchens, pantries, breakfast rooms, dining rooms, and similar areas of dwelling units, receptacle outlets for countertop and work surfaces shall be installed in accordance with 210.52(C)(1) through (C)(5).

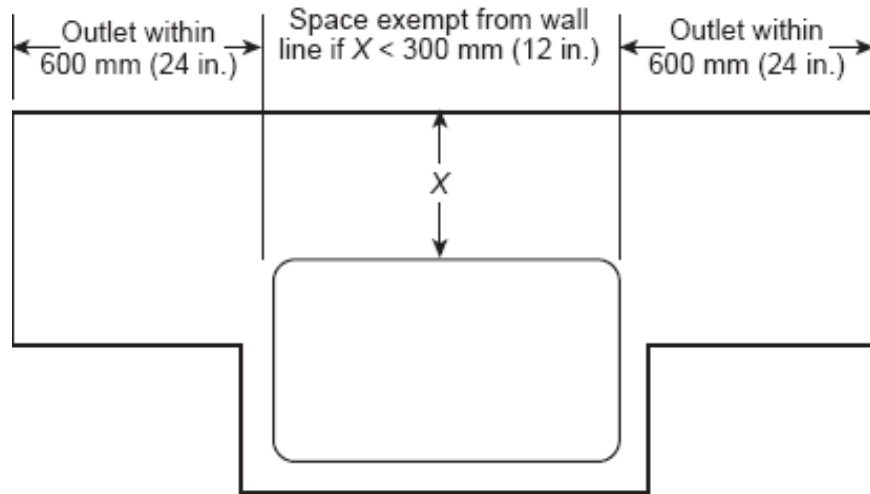
(1) **Wall Countertop and Work Surfaces.** A receptacle outlet shall be installed at each wall countertop and work surface that is 300 mm (12 in.) or wider. Receptacle outlets shall be installed so that no point along the wall line is more than 600 mm (24 in.) measured horizontally from a receptacle outlet in that space.

*Exception: Receptacle outlets shall not be required on a wall directly behind a range, counter-mounted cooking unit, or sink in the installation described in Figure 210.52(C)(1).*

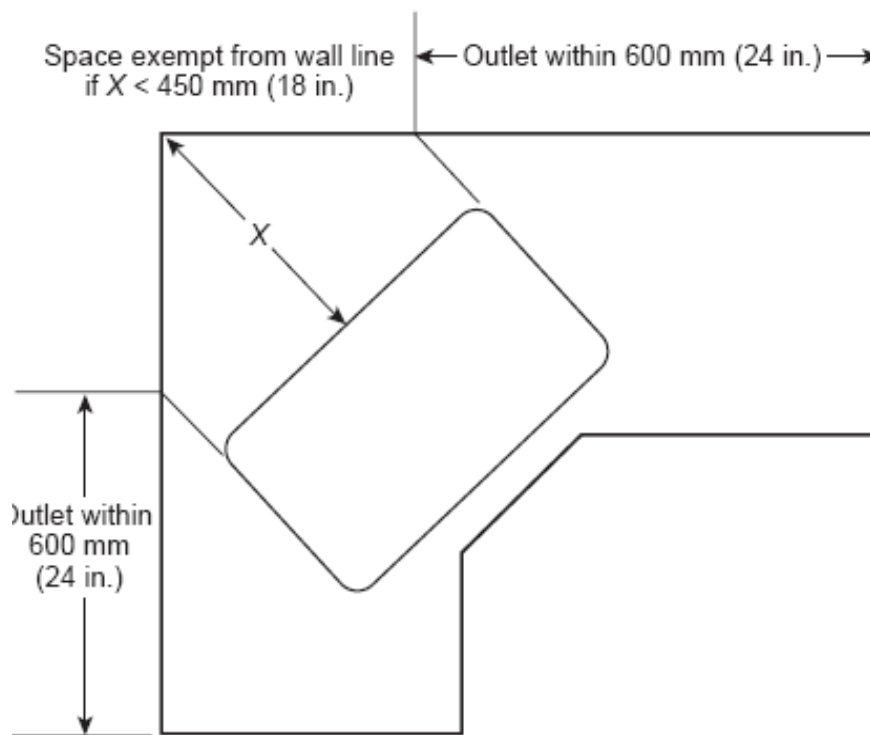
(2) **Island Countertop Spaces.** At least one receptacle shall be installed at each island countertop space with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater.

(3) **Peninsular Countertop Spaces.** At least one receptacle outlet shall be installed at each peninsular countertop long dimension space with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater. A peninsular countertop is measured from the connected perpendicular wall.

(4) **Separate Spaces.** Countertop spaces separated by rangetops, refrigerators, or sinks shall be considered as separate countertop spaces in applying the requirements of 210.52(C)(1). ~~If a range, counter-mounted cooking unit, or sink is installed in an island or peninsular countertop and the depths of the countertop behind the range, counter-mounted cooking unit, or sink is less than 300 mm (12 in.), the range, counter-mounted cooking unit, or sink shall be considered to divide the countertop space into two separate countertop spaces. Each separate countertop space shall comply with the applicable requirements of 210.52(C).~~ If a range, counter-mounted cooking unit, or sink is installed in an island or peninsular countertop, then it is considered to divide the countertop space into two separate countertop spaces. Each separate countertop space shall comply with the applicable requirements in 210.52 (C).



**Range, counter-mounted cooking unit extending from face of counter**



**Range, counter-mounted cooking unit mounted in corner**

**Figure 210.52(C)(1) Determination of Area Behind a Range, Counter-Mounted Cooking Unit, or Sink.**

Informational Note: See 406.5(E) and 406.5(G) for requirements for installation of receptacles in countertops and 406.5(F) and 406.5(G) for requirements for installation of receptacles in work surfaces.

- (5) Receptacle Outlet Location.** Receptacle outlets shall be located on or above, but not more than 500 mm (20 in.) above, the countertop or work surface. Receptacle outlet assemblies listed for use in countertops or work surfaces shall be permitted to be installed in countertops or work surfaces. Receptacle outlets rendered not readily accessible by appliances fastened in place, appliance garages, sinks, or rangetops as covered in 210.52(C)(1), Exception, or appliances occupying dedicated space shall not be considered as these required outlets.

~~Informational Note: See 406.5(E) for requirements for installation of receptacles in countertops.~~

*Exception to (5): To comply with the following conditions (1) and (2), receptacle outlets shall be permitted to be mounted not more than 300 mm (12 in.) below the countertop or work surface. Receptacles mounted below a countertop in accordance with this exception shall not be located where the countertop or work surface extends more than 150 mm (6 in.) beyond its support base.*

- (1) *Construction for the physically impaired.*
- (2) *On island and peninsular countertops where the countertop is flat across its entire surface (no backsplashes, dividers, etc.) and there are no means to mount a receptacle within 500 mm (20 in.) above the countertop, such as an overhead cabinet.*

**(D) Bathrooms.** At least one receptacle outlet shall be installed in bathrooms within 900 mm (3 ft.) of the outside edge of each basin. The receptacle outlet shall be located on a wall or partition that is adjacent to the basin or basin countertop, located on the countertop, or installed on the side or face of the basin cabinet. In no case shall the receptacle be located more than 300 mm (12 in.) below the top of the basin or basin countertop. Receptacle outlet assemblies listed for use in countertops shall be permitted to be installed in the countertop.

Informational Note: See 406.5(E) and 406.5(G) for requirements for installation of receptacles in countertops.

**(E) Outdoor Outlets.** Outdoor receptacle outlets shall be installed in accordance with (E)(1) through (E)(3).

Informational Note: See 210.8(A)(3).

- (1) One-Family and Two-Family Dwellings.** For a one-family dwelling and each unit of a two-family dwelling that is at grade level, at least one receptacle outlet readily accessible from grade and not more than 2.0 m (6 1/2 ft) above grade shall be installed at the front and back of the dwelling.
- (2) Multifamily Dwellings.** For each dwelling unit of a multifamily dwelling where the dwelling unit is located at grade level and provided with individual exterior entrance/egress, at least one receptacle outlet readily accessible

from grade and not more than 2.0 m (6 1/2 ft) above grade level shall be installed.

- (3) Balconies, Decks, and Porches.** Balconies, decks, and porches that are attached to the dwelling unit and are accessible from inside the dwelling unit shall have at least one receptacle outlet accessible from the balcony, deck, or porch. The receptacle outlet shall not be located more than 2.0 m (6 1/2 ft) above the balcony, deck, or porch walking surface.

**(F) Laundry Areas.** In dwelling units, at least one receptacle outlet shall be installed in areas designated for the installation of laundry equipment.

*Exception No. 1: A receptacle for laundry equipment shall not be required in a dwelling unit of a multifamily building where laundry facilities are provided on the premises for use by all building occupants.*

*Exception No. 2: A receptacle for laundry equipment shall not be required in other than one-family dwellings where laundry facilities are not to be installed or permitted.*

**(G) Basements, Garages, and Accessory Buildings.** For a one- and two-family dwellings, at least one receptacle outlet shall be installed in the areas specified in 210.52(G)(1) through (3). These receptacles shall be in addition to receptacles required for specific equipment.

- (1) Garages.** In each attached garage and each detached garage with electric power, at least one receptacle outlet shall be installed in each vehicle bay and not more than 1.7 m (5 1/2 ft) above the floor.

a. **Garage Door Opener Receptacle Outlets.** A single receptacle outlet shall be installed in the garage ceiling for each vehicle entry door. The single receptacle outlet shall be located near the center of the finished edges of the opening. The single receptacle outlet shall be located from the opening by the sum total of the height of the door plus a minimum of two feet.

**(2) Accessory Buildings.** In each accessory building with electric power

**(3) Basements.** In each separate unfinished portion of a basement.

**(H) Hallways.** In dwelling units, hallways of 3.0 m (10 ft) or more in length shall have at least one receptacle outlet.

As used in this subsection, the hallway length shall be considered the length along the centerline of the hallway without passing through a doorway.

**(I) Foyers.** Foyers that are not part of a hallway in accordance with 210.52(H) and that have an area that is greater than 5.6 m<sup>2</sup> (60 ft<sup>2</sup>) shall have a receptacle(s) located in each wall space 900 mm (3 ft) or more in width. Doorways, door-side windows that extend to the floor, and similar openings shall not be considered wall space.

5-410 **Section 210.62 of the NPFA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**210.62 Show Windows.** At least one 125-volt, single-phase 15- or 20-ampere receptacle outlet shall be installed within 450 mm (18 in.) of the top of a show window for each 3.7 linear m (12 linear ft) or major fraction thereof of show window area measured horizontally at its maximum width. For the purposes of this section, in buildings with a non-residential occupancy, each exterior window shall be considered a show window unless expressly exempted by the enforcing authority.

5-411 **Section 220.12 of the NPFA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**220.12 Lighting Load for Specified Occupancies.** A unit load of not less than that specified in Table 220.12 for occupancies specified shall constitute the minimum lighting load. The floor area for each floor shall be calculated from the outside dimensions of the building, dwelling unit, or other are involved. For dwelling units, the calculated floor area shall not include open porches, garages, or unused or unfinished spaces not adaptable for future use.

Informational Note: The unit values are based on minimum load conditions and 100 percent power factor and may not provide sufficient capacity for the installation contemplated.

~~Exception No. 1: Where the building is designed and constructed to comply with an energy code adopted by the local authority, the lighting load shall be permitted to be calculated at the values specified in the energy code where the following conditions are met:~~

- ~~(1) A power monitoring system is installed that will provide continuous information regarding the total general lighting load of the building.~~
- ~~(2) The power monitoring system will be set with alarm values to alert the building owner or manager if the lighting load exceeds the values set by the energy code.~~
- ~~(3) The demand factors specified in 220.42 are not applied to the general lighting load.~~

~~Exception No. 2 No. 1: Where a building is designed and constructed to comply with an energy code adopted by the local authority and specifying an overall lighting density of less than 13.5 volt-amperes/13.5 m<sup>2</sup> (1.2 volt-amperes/1.2 ft<sup>2</sup>), the unit lighting loads in Table 220.12 for office and bank areas within the building shall be permitted to be reduced by 11 volt-amperes/11 m<sup>2</sup> (1 volt-amperes/1 ft<sup>2</sup>).~~

5-412 **Section 225.17 of the NPFA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:



**225.17 Masts as Supports.** Only feeder or branch-circuit conductors specified within this section shall be permitted to be attached to the feeder and/or branch-circuit mast. Masts used for the support of final spans of feeders or branch circuits shall be installed in accordance with 225.17(A) and (B).

**(A) Strength.** The mast shall have adequate strength or be supported by braces or guys to safely withstand the strain imposed by the overhead feeder or branch-circuit conductors. Hubs intended for use with a conduit serving as a mast for support of feeder or branch-circuit conductors shall be identified for use with a mast.

**(B) Attachment.** Feeder and/or branch-circuit conductors shall not be attached to a mast where the connection is between a weatherhead or the end of the conduit and a coupling where the coupling is located above the last point of securement to the building or other structure or where the coupling is located above the building or other structure.

**(C) Additional Requirements.** Where a mast is used for the support of final spans of feeders or branch circuits, it shall be a galvanized rigid conduit with a minimum trade size diameter of two inches (2 in.). Where the mast projects above the roof surface in excess of three feet (3 ft.), the mast shall be supported by braces or guys to withstand safely the strain imposed by the drop. Where raceway-type masts are used, all raceway fittings shall be identified for use with the masts. Only the feeder or branch-circuit conductors specified within this section shall be permitted to be attached to the feeder and/or branch-circuit mast.

5-413

**Section 230.28 of the NFPA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**NFPA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**~~230.28 Service Masts as Supports.~~** ~~Only power service-drop or overhead service conductors shall be permitted to be attached to a service mast. Services masts used for the support of service-drop or overhead service conductors shall be installed in accordance with 230.28(A) and (B).~~ Where a service mast is used for the support of service-drop conductors, it shall be a galvanized rigid conduit with a minimum trade size diameter of two inches (2 in.). Where the service mast projects above the roof surface in excess of three feet (3 ft.), the mast shall be supported by braces or guys to withstand safely the strain imposed by the service-drop. Where raceway-type service masts are used, all raceway fittings shall be identified for use with the service masts. Only power service-drop conductors shall be permitted to be attached to a service mast.

**~~(A) Strength.~~** ~~The service mast shall be of adequate strength or be supported by braces or guys to withstand safely the strain imposed by the service-drop or overhead service conductors. Hubs intended for use with a conduit that serves as a service mast shall be identified for use with service-entrance equipment.~~

~~(B) Attachment. Service drop or overhead service conductors shall not be attached to a service mast between a weatherhead or the end of the conduit and a coupling where the coupling is located above the last point of securement to the building or other structure or is located above the building or other structure.~~

5-414

**Section 230.43 of the NFPA 70, *National Electrical Code, 2017 Edition*, is hereby amended to read 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:

- (1) Open wiring on insulators.
- (2) Type IGS cable.
- (3) Rigid metal conduit (RMC).
- (4) Intermediate metal conduit (IMC).
- (5) Electrical metallic tubing (EMT).
- (6) Electrical nonmetallic tubing (ENT).
- ~~(7) Service-entrance cables~~
- ~~(8)~~(7) Wireways.
- ~~(9)~~(8) Busways.
- ~~(10)~~(9) Auxiliary gutters.
- ~~(11)~~(10) Rigid polyvinyl chloride conduit (PVC).
- ~~(12)~~(11) Cablebus.
- ~~(13)~~(12) Type MC cable.
- ~~(14)~~(13) Mineral-insulated, metal-sheathed cable, Type MI.
- ~~(15)~~(14) 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)~~(15) Liquidtight flexible nonmetallic conduit (LFNC).
- ~~(17)~~(16) High Density polyethylene conduit (HDPE).

~~(48)~~(17) Nonmetallic underground conduit with conductors (NUCC).

~~(49)~~(18) Reinforced thermosetting resin conduit (RTRC).

5-415

**Section 230.70 of the NFPA 70, *National Electrical Code, 2017 Edition***, is hereby amended to read as follows:

**230.70 General.** Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors.

**(A) Location.** The service disconnecting means shall be installed in accordance with 230.70(A)(1), (A)(2), and (A)(3).

**(1) Readily Accessible Location.** The service disconnecting means shall be installed at a readily accessible location either outside of a building or structure or inside nearest the point of entrance of the service conductors. Service entrance conductors shall not exceed six feet (6 ft.) in length from the point of entrance to the building or structure.

**(2) Bathrooms.** Service disconnecting means shall not be installed in bathrooms.

**(3) Remote Control.** Where a remote control device(s) is used to actuate the service disconnecting means, the service disconnecting means shall be located in accordance with 230.70(A)(1).

**(B) Marking.** Each service disconnect shall be permanently marked to identify it as a service disconnect.

**(C) Suitable for Use.** Each service disconnecting means shall be suitable for the prevailing conditions. Service equipment installed in hazardous (classified) locations shall comply with the requirements of Articles 500 through 517.

5-416

**Section 230.72 of the NFPA 70, *National Electrical Code, 2017 Edition***, is hereby amended to read as follows:

**230.72 Grouping of Disconnects.**

**(A) General.** The two to six disconnects as permitted in 230.71 shall be grouped. Each disconnect shall be marked to indicate the load to be served.

**(1)** Meters and disconnects shall be marked and installed by numerical or alphabetical order, top to bottom or left to right, unless exempted by the enforcing authority.

**(2)** Meter enclosures and service equipment shall be permanently marked with phenolic labels, engraved plaques, or other approved means.

*Exception: One of the two to six service disconnecting mean permitted in 230.71, where used only for a water pump also intended to provide fire*

*protection, shall be permitted to be located remote from the other disconnecting means. If remotely installed in accordance with this exception, a plaque shall be posted at the location of the remaining grouped disconnects denoting its location.*

**(B) Additional Service Disconnecting Means.** The one or more additional service disconnecting means for fire pumps, emergency systems, legally required standby, or optional standby services permitted by 230.2 shall be installed remote from the one to six service disconnecting means for normal service to minimize the possibility of simultaneous interruption of supply.

**(C) Access to Occupants.** In a multiple-occupancy building, each occupant shall have access to the occupant's service disconnecting means.

*Exception: In a multiple-occupancy building where electric service and electrical maintenance are provided by the building management and where these are under continuous building management supervision, the service disconnecting means supplying more than one occupancy shall be permitted to be accessible to authorized management personnel only.*

5-417

**Section 250.68 of the NFPA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**250.68 Grounding Electrode Conductors and Bonding Jumper Connection to Grounding Electrodes.** The connection of a grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at a separately derived system and associated bonding jumper(s) shall be made as specified 250.68(A) through (C).

**(A) Accessibility.** All mechanical elements used to terminate a grounding electrode conductor or bonding jumper to a grounding electrode shall be accessible. The location of the grounding electrode conductor connection to the grounding electrode(s) shall be permanently stated on a plaque or directory on the service disconnecting means.

*Exception No. 1: An encased or buried connection to a concrete-encased, driven, or buried grounding electrode shall not be required to be accessible.*

*Exception No. 2: Exothermic or irreversible compression connections used at terminations, together with the mechanical means used to attach such terminations to fireproofed structural metal whether or not the mechanical means is reversible, shall not be required to be accessible.*

**(B) Effective Grounding Path.** The connection of a grounding electrode conductor or bonding jumper to a grounding electrode shall be made in a manner that will ensure ~~an~~ a permanent and effective grounding-path. Where necessary to ensure the grounding path for a metal piping system used as a grounding electrode, bonding shall be provided around insulated joints and around any equipment likely to be disconnected for repairs or replacement. Bonding jumpers shall be of sufficient length to permit removal of such equipment while retaining the integrity of the grounding path.

**(C) Grounding Electrode Connections.** Grounding electrode conductors and bonding jumpers shall be permitted to be connected to the following locations and used to extend the connection to an electrode(s):

- (1) Interior metal water piping located not more than 1.52 m (5 ft.) from the point of entrance to the building shall be permitted to be used as a conductor to interconnect electrodes that are part of the grounding electrode system.

*Exception: In industrial, commercial, and institutional buildings or structures, if conditions of maintenance and supervision ensure that only qualified persons service the installation, interior metal water piping located more than 1.52 m (5 ft.) from the point of entrance to the building shall be permitted as a bonding conductor to interconnect electrodes that are part of the grounding electrode system, or as a grounding electrode conductor, if the entire length, other than short sections passing perpendicularly through walls, floors, and ceilings, of the interior metal water pipe that is being used for the conductor is exposed.*

- (2) The metal structural frame of a building shall be permitted to be used as a conductor to interconnect electrodes that are part of the grounding electrode system, or as a grounding electrode conductor.
- (3) A concrete-encased electrode of either the conductor type, reinforcing rod or bar installed in accordance with 250.52(A)(3) extended from its location within the concrete to an accessible location above the concrete shall be permitted.

5-418

**Section 334.12 of the NFPA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**334.12 Uses Not Permitted.**

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

- ~~(1) In any dwelling or structure not specifically permitted in 334.10(1), (2), (3), and (5).~~
- (1) In any occupancy other than Group R.
- (2) Exposed within a dropped or suspended ceiling cavity in other than one- and two-family and multifamily dwellings.
- (3) As service-entrance cable.
- (4) In commercial garages having hazardous (classified) locations as defined in 511.3.
- (5) In theaters and similar locations, except where permitted in 518.4(B).

- (6) In motion picture studios.
- (7) In storage battery rooms.
- (8) In hoistways or on elevators or escalators.
- (9) Embedded in poured cement, concrete or aggregate.
- (10) In hazardous (classified) locations, except where specifically permitted by other articles in this Code.

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

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

5-419 **Section 334.40 of the NPFA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**334.40 Boxes and Fittings.**

**(A) Boxes of Insulating Material.** Nonmetallic outlet boxes shall be permitted as provided by 314.3.

**(B) Devices of Insulating Materials.** ~~Self-contained switches, self-contained receptacles and nonmetallic sheathed cable interconnector devices of insulating material that are listed shall be permitted to be used in exposed cable wiring and for repair in existing buildings where the cable is concealed. Opening in such devices shall form a close fit around the outer covering of the cable, and the device shall fully enclose the part of the cable from which any part of the covering has been removed. Where connections to conductors are by binding screw terminal there shall be available as many terminals as conductors. Self-contained switches, self-contained receptacles, and nonmetallic sheathed cable interconnector devices shall not be permitted.~~

5-420 **Section 362.10 of the NPFA 70, National Electrical Code, 2017 Edition,** is hereby amended to read as follows:

**362.10 Uses Permitted.** For the purpose of this article, the first floor of a building shall be that floor that has 50 percent or more of the exterior wall surface area level with or above finished grade. One additional level that is the first level and not designed for human habitation and used only for vehicle parking, storage, or similar use shall be permitted. The use of ENT and fittings shall be permitted in the following:

- (1) In any building not exceeding three floors above grade as follows:
  - a. For exposed work, where not prohibited by 362.12.
  - b. Concealed within walls, floors, and ceilings.
- (2) In any building exceeding three floors above grade, ENT shall be concealed within walls, floors, and ceilings where the walls, floors, and ceilings provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies. The 15-minute-finish-rated thermal barrier shall be permitted to be used for combustible or noncombustible walls, floors, and ceilings.

*Exception to (2): Where a fire sprinkler system(s) is installed in accordance with NFPA 13-2013, Standard for the Installation of Sprinkler Systems, on all floors, ENT shall be permitted to be used within walls, floors, and ceilings, exposed or concealed, in buildings exceeding three floors above grade.*

Informational Note: A finish rating is established for assemblies containing combustible (wood) supports. The finish rating is defined as the time at which the wood stud or wood joist reaches an average temperature rise of 121°C (250°F) or an individual temperature of 163°C (325°F) as measured on the plane of the wood nearest the fire. A finish rating is not intended to represent a rating for a membrane ceiling.

- (3) In locations subject to severe corrosive influences as covered in 300.6 and where subject to chemicals for which the materials are specifically approved.
- (4) In concealed, dry, and damp locations not prohibited by 362.12.
- ~~(5)~~ ~~Above suspended ceilings where the suspended ceilings provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies, except as permitted in 362.10(1)(a).~~

~~*Exception to (5): ENT shall be permitted to be used above suspended ceilings in buildings exceeding three floors above grade where the building is protected throughout by a fire sprinkler system installed in accordance with NFPA 13-2010, Standard for the Installation of Sprinkler Systems.*~~

- ~~(6)~~(5) Encased in poured concrete, or embedded in a concrete slab on grade where ENT is placed on sand or approved screenings, provided fittings identified for this purpose are used for connections.
- ~~(7)~~(6) For wet locations indoors as permitted in this section or in a concrete slab on or below grade, with fittings listed for the purpose.
- ~~(8)~~(7) Metric designator 16 through 27 (trade size ½ through 1) as listed manufactured prewired assembly.

Informational Note: Extreme cold may cause some types of nonmetallic conduits to become brittle and therefore more susceptible to damage from physical contact.

- ~~(9)~~(8) Conductors or cables rated at a temperature higher than the listed Temperature rating of ENT shall be permitted to be installed in ENT, if the conductors or cables are not operated at a temperature higher Than the listed temperature rating of the ENT.

5-421

**Section 701.12 of the NFPA 70, *National Electrical Code, 2017 Edition***, is hereby amended to read as follows:

**701.12 General Requirements** Current supply shall be such that, in the event of failure of the normal supply to, or within, the building or group of buildings concerned, legally required standby power will be available within the time required for the application but not to exceed 60 seconds. The supply system for legally required standby purposes, in addition to the normal services to the building, shall be permitted to comprise one or more of the types of systems described in 701.12(A) through (F), Unit equipment in accordance with 701.12 (G) shall satisfy the applicable requirements of this article.

In selecting a legally required standby source of power, consideration shall be given to the type of service to be rendered, whether of short-time duration or long duration.

Consideration shall be given to the location or design, or both, of all equipment to minimize the hazards that might cause complete failure due to floods, fires, icing, and vandalism.

Informational Note: For further information, see ANSI/IEEE 493-2007, *Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems*.

**(A) Storage Battery.** Storage batteries shall be of suitable rating and capacity to supply and maintain the total load for a minimum period of 1 1/2 hours without the voltage applied to the load falling below 87.1 percent of normal. Automotive-type batteries shall not be used.

An automatic battery charging means shall be provided.

**(B) Generator Set.**

**(1) Prime Mover-Driven.** For a generator set driven by a prime mover acceptable to the authority having jurisdiction and sized in accordance with 701.6, means shall be provided for automatically starting the prime mover upon failure of the normal service and for automatic transfer and operation of all required electrical circuits. A time-delay feature permitting a 15-minute setting shall be provided to avoid transfer in case of short-time re-establishment of the normal source.

**(2) Internal Combustion Engines as Prime Mover.** Where internal combustion engines are used as the prime mover, an on-site fuel supply shall be provided with an on-premise fuel supply sufficient for not less than



2 hours' full-demand operation of the system. Where power is needed for the operation of the fuel transfer pumps to deliver fuel to a generator set day tank, the pumps shall be connected to the legally required standby power system.

- (3) **Dual Supplies.** Prime movers shall not be solely dependent on a public utility gas system for their fuel supply or municipal water supply for their cooling systems. Means shall be provided for automatically transferring one fuel supply to another where dual fuel supplies are used.

*Exception: Where acceptable to the authority having jurisdiction, the use of other than on-site fuels shall be permitted where there is a low probability of a simultaneous failure of both the off-site fuel delivery system and power from the outside electrical utility company.*

- (4) **Battery Power.** Where a storage battery is used for control or signal power or as the means of starting the prime mover, it shall be suitable for the purpose and shall be equipped with an automatic charging means independent of the generator set.

- (5) **Outdoor Generator Sets.** Where an outdoor housed generator set is equipped with a readily accessible disconnecting means in accordance with 445.18, and the disconnecting means is located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors serve or pass through the building or structure. ~~Where the generator supply conductors terminate at a disconnecting means in or on a building or structure, the disconnecting means shall meet the requirements of 225.36.~~

**(C) Uninterruptible Power Supplies.** Uninterruptible power supplied used to provide power for legally required standby systems shall comply with the applicable provisions of 701.11(A) and (B).

**(D) Separate Service.** Where approved, a separate service shall be permitted as a legally required source of standby power. This service shall be in accordance with the applicable provisions of Article 230, with separate service drop or lateral or a separate set of overhead or underground service conductors sufficiently remote electrically and physically from any other service to minimize the possibility of simultaneous interruption of supply from an occurrence in another service.

~~**(E) Connection Ahead of Service Disconnecting Means.** Where acceptable to the authority having jurisdiction, connections located ahead of and not within the same cabinet, enclosure, or vertical switchboard section as the service disconnecting means shall be permitted. The legally required standby service shall be sufficiently separated from the normal main service disconnecting means to minimize simultaneous interruption of supply through an occurrence within the building or groups of buildings served.~~

~~Informational Note: See 230.82 for equipment permitted on the supply side of a service disconnecting means.~~

**(F)(E) Fuel Cell System.** Fuel cell systems used as a source of power for legally required standby systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.

Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.

Where a single fuel cell system serves as the normal supply for the building a group of buildings concerned, it shall not serve as the sole source of power for the legally required standby system.

**(G)(F) Unit Equipment.** Individual unit equipment for legally required standby illumination shall consist of the following:

- (1) A rechargeable battery.
- (2) A battery charging means.
- (3) Provisions for one or more lamps mounted on the equipment and shall be permitted to have terminals for remote lamps.
- (4) A relaying device arranged to energize the lamps automatically upon failure of the supply to the unit equipment.

The batteries shall be of suitable rating and capacity to supply and maintain the total lamp load associated with the unit for not less than (1) or (b):

(a) For a period of 1 1/2 hours, without the voltage falling below 87 1/2 percent of normal voltage

(b) The unit equipment shall supply and maintain not less than 60 percent of the initial emergency illumination for a period of at least 1 1/2 hours.

Unit equipment shall be permanently fixed in place (i.e., not portable) and shall have all wiring to each unit installed in accordance with the requirements of any of the wiring methods in Chapter 3. Flexible cord-and-plug connection shall be permitted, provided that the cord does not exceed 900 mm (3 ft) in length. The branch circuit feeding the unit equipment shall be the same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches. Legally required standby luminaries (illumination fixtures) that obtain power from a unit equipment and are not part of the unit equipment shall be wired to the unit equipment by one of the wiring methods of Chapter 3.

*Exception: In a separate and uninterrupted area supplied by a minimum of three normal lighting circuits, a separate branch circuit for unit equipment shall be permitted if it originates from the same panelboard as that of the normal lighting circuits and is provided with a lock-on feature.*

5-422

**STANDARD INSTALLATION, ELECTRICAL EQUIPMENT.**

Except as otherwise provided in this Article, all installations of electrical wiring and equipment shall be in conformity with the provisions of this Article, with the statutes of the State of Kansas, with any other rules and regulations promulgated by bodies having authority, and with electrical standards for safety to persons or property. Where no specific standards are prescribed by this Article, the statutes of the State of Kansas, or by any other rules and regulations promulgated by bodies having authority, conformity with the regulations set forth in the NFPA 70, *National Electrical Code, 2017 Edition*, as approved by the American Safety Code and by the American National Standards Institute, as well as other provisions of other safety codes approved by the American National Standards Institute, shall be *prima facie* evidence of conformity with the approved standards for safety to persons and property.

5-423

**LIABILITY.** This Article shall not be construed to reduce the liability of any person owning, operating, or controlling any building, structure, or system thereof for any damages to persons or property caused by defects in anything covered by the NFPA 70, *National Electrical Code, 2017 Edition*; nor shall the City, its agent, or its enforcing authority be held to assume any such liability by reason of any inspections performed or for any permits or certificates issued under the auspices of this Article.

**SECTION 3.** If any section, sentence, clause, or phrase of this ordinance is found to be unconstitutional or is otherwise held invalid by any court of competent jurisdiction, it shall not affect the validity of any remaining parts of this ordinance.

**SECTION 4.** After passage and publication as provided by law, this ordinance shall be in full force and effect commencing July 1, 2019.

**PASSED** by the Governing Body of the City of Lawrence, Kansas, this \_\_\_\_ day of \_\_\_\_\_, 2019.

**APPROVED:**

\_\_\_\_\_  
Lisa Larsen  
Mayor

**ATTEST:**

\_\_\_\_\_  
Sherri Riedemann  
City Clerk

**APPROVED AS TO FORM:**

\_\_\_\_\_  
Toni R. Wheeler  
City Attorney