TABLE 1-E (2017)

Effective October 1, 2017
Interim Amendments Effective October 1, 2020

Oregon Amendments to the 2017 edition of the National Fire Protection Association (NFPA) 70, National Electrical Code (NEC) for the 2017 Oregon Electrical Specialty Code.

For the purpose of identifying Oregon amendments to the NFPA 70, NEC – "OESC" followed by a code section denotes an Oregon amendment to that section of code. Amendments may either be additions of code language developed by Oregon, or the deletion of NFPA 70, NEC code language. Language contained in the NFPA 70, NEC, not listed in this table has not been amended by Oregon.

See **OAR 918-305-0030** for other codes or publications that may impact electrical installations.

OESC 90.4 **Enforcement.** (First paragraph, no change to model code).

This *Code* is intended to be suitable for mandatory application by governmental bodies that exercise legal jurisdiction over electrical installations, including signaling and communications systems, and for use by insurance inspectors. The authority having jurisdiction for enforcement of the *Code* has the responsibility for making interpretations of the rules, for deciding on the approval of equipment and materials, and for granting the special permission contemplated in a number of the rules.

By special permission, the authority having jurisdiction may waive specific requirements in this *Code* or permit alternative methods where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety.

Requests for special permission shall be made in writing to the authority having jurisdiction. Special permission must be granted in writing by the authority having jurisdiction and shall be obtained prior to the start of the electrical installation.

This *Code* may require new products, constructions, or materials that may not yet be available at the time the *Code* is adopted. In such event, the authority having jurisdiction may permit the use of the products, constructions, or materials that comply with the most recent previous edition of this *Code* adopted by the jurisdiction.

Where the 2017 NEC requires electrical products to be "listed" or "labeled", the words "listed" or "labeled" shall have the same meaning as "certified electrical product" under ORS 479.530.

OESC 100 **Definitions.**

Fire Protection System. ***Approved*** **devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof.** (*Source OSSC*)

OESC 110.10 **Circuit Impedance; Short-Circuit Current Ratings, and Other Characteristics.** The overcurrent protective devices, the total impedance, the equipment short-circuit current ratings, and other characteristics of the circuit to be protected shall be selected and coordinated to permit the circuit protective devices used to clear a fault to do so without extensive damage to the electrical equipment of the circuit. This fault shall be assumed to be either between two or more of the circuit conductors or between any circuit conductor and the equipment grounding conductor(s) permitted in 250.118. Listed equipment applied in accordance with their listing shall be considered to meet the requirements of this section.

Exception No. 1: A temporary service may be energized without demonstrating compliance with this section. This exception is applied at the discretion of the supervising electrician.

Exception No. 2: Fault-current values provided by the serving utility may be used to satisfy the labeling requirements.

OESC 110.14 **(D) Installation.** Where a tightening torque is indicated as a numeric value on equipment or in installation instructions provided by the manufacturer, a calibrated torque tool shall be used to achieve the indicated torque value, unless the equipment manufacturer has provided installation instructions for an alternative method of achieving the required torque.

The permit holder is not required to demonstrate compliance with this section.

OESC 110.24 **(A) Field Marking.** Service equipment *at* other than dwelling units shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved. *The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.*

Exception No. 1: A temporary service may be energized without demonstrating compliance with this section. This exception is applied at the discretion of the supervising electrician.

Exception No. 2: Fault-current values provided by the serving utility may be used to satisfy the labeling requirements.

(B) Modifications.

(Exception: Not adopted by the State of Oregon).

~~*Exception: The field marking requirements in 110.24(A) and 110.24(B) shall not be required in industrial installations where conditions of maintenance and supervision ensure that only qualified persons service the equipment.*~~

OESC 110.26 **(C)(3) Personnel Doors.** Where equipment rated 800 A or more that contains overcurrent devices, switching devices, or control devices is installed **in structures other than one- and two-family dwellings and individual multifamily units** and there is a personnel door(s) intended for entrance to and egress from the working space less than 7.6 m (25 ft) from the nearest edge of the working space, the door(s) shall open in the direction of egress and be equipped with ~~listed~~ panic hardware.

Note: Additional construction requirements are located in the *Oregon Structural Specialty Code* (OSSC) Section 1008.1.10. This section governs panic hardware listing and installation requirements. Section 1008.1.10.1 is not part of this code but is provided here for the reader's convenience.

> **OSSC Section 1008.1.10.1 Installation.** Where panic or fire exit hardware is installed, it shall comply with the following:
>
> 1. Panic hardware shall be listed in accordance with UL 305;
> 2. Fire exit hardware shall be listed in accordance with UL 10C and UL 305;
> 3. The actuating portion of the releasing device shall extend at least one-half of the door leaf width; and
> 4. The maximum unlatching force shall not exceed 15 pounds (67 N).
>
> **OSSC Section 1008.1.10.2 Balanced doors.** If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

(D) Illumination. Illumination **of 10 foot candles average, measured at the floor,** shall be provided for all working spaces about service equipment, switchgear switchboards, switchgear, panelboards, or motor control centers installed indoors. Control by automatic means only shall not be permitted. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles.

OESC 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), **(B), (C) and** ~~through~~ (E) **as amended**. **210.8(D) is not adopted by the State of Oregon.**

The ground-fault circuit-interrupter shall be installed in a readily accessible location.

Informational note no. 3: See 760.41(B) and 760.121(B) for power supply requirements for fire alarm systems.

(A) Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in 210.8(A)(1) through (10) shall have ground-fault circuit-interrupter protection for personnel.

(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.

(5) Unfinished portions or areas of the basement not intended as habitable rooms.

Exception to (5): *A receptacle supplying only a permanently installed fire alarm or burglar alarm system shall not be required to have ground-fault circuit-interrupter protection* ***if the receptacle is labeled as "not GFCI protected."***

(6) Kitchens – where the receptacles are installed to serve the countertop surfaces

(7) Sinks – where receptacles are installed within 1.8m (6 ft) from the top inside edge of the bowl of the sink.

(10) Laundry areas

Exception to (2),(5),(6),(7),(10): GFCI protection shall not be required for a single receptacle serving an appliance or a duplex receptacle serving two appliances if all of the following conditions are met:

a. The appliance is located within a dedicated space.
b. In normal use the appliance is not easily moved or is fastened in place.
c. The appliance is cord-and-plug connected.
d. The receptacle is labeled as "not GFCI protected."

The receptacle(s) shall not be considered as meeting the requirements of 210.52(G).

(B) Other than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles ~~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 ground-fault circuit-interrupter protection for personnel.

(D) Kitchen Dishwasher Branch Circuit. (Not adopted by the State of Oregon) ~~GFCI protection shall be provided for outlets that supply dishwashers installed in dwelling unit locations.~~

(E) Crawl Space Lighting Outlets. GFCI protection shall be provided for lighting outlets not exceeding 120 volts installed in crawl spaces **at or below grade level**.

Exception to 210.8(A),(B), and (E): Receptacle ground-fault protection shall not be required for a single receptacle for sewage or sump pumps if the receptacle is labeled as "not GFCI protected."

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

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 not be required on branch circuits supplying receptacles located in hallways, kitchens or laundry areas and GFCI protected receptacles installed in dining rooms.

Exception No. 3: AFCI protection shall not be required for optional, dedicated outlets that supply equipment known to cause unwanted tripping of AFCI devices.

Exception No 4: AFCI protection shall not be required for branch circuits that serve an appliance that is not easily moved or that is fastened in place.

(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. (Not adopted by the State of Oregon) ~~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~~ **comply with** 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.*~~

(1) Extensions or modifications of existing circuits shall not require the installation of AFCI protection.

(2) Replacement or upgrading of a service or panelboard shall not require that existing circuits be protected by AFCI devices.

(3) Where an existing branch circuit is replaced, the installation of AFCI protection shall be required.

OESC 210.52 (C)(1) Wall Countertop Spaces and Work Surface.

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).* ***Despite Figure 210.52(C)(1), no receptacle shall be required behind a range, counter-mounted cooking unit, or sink mounted in a corner.***

(C)(2) Island Countertop ~~Spaces~~. At least one receptacle outlet 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.

(C)(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.)~~ **1.05 m (42 in.)** or greater and a short dimension of 300 mm (12 in.) or greater. A peninsular countertop is measured from the ~~connected perpendicular wall~~ **connecting edge**.

(C)(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~~ **a** peninsular countertop and the depth of the countertop behind the range, counter-mounted cooking unit, or sink is...

(E)(3) Balconies, Decks, and Porches.

Exception to (3): Decks or porches located at grade level with an area of less than 20 sq. ft. are not required to have an additional receptacle installed.

~~**(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^2 (60 ft^2) 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.~~

(I) Alcoves. In dwelling units, alcoves shall have at least one receptacle installed. These outlets shall be in addition to the required hallway outlets.

As used in this subsection an Alcove is an area extending from, and returning to, the common wall of hallways, foyers, entries, and landings with a depth of not less than 2 ft. and a length of not less than 3 ft.

OESC 210.63 Heating, Air Conditioning, and Refrigeration Equipment Outlet.

Exception No. 1: *A receptacle outlet shall not be required at one- and two-family dwellings for the service of evaporative coolers.*

Exception No. 2: An additional receptacle outlet shall not be required to be installed when replacing existing HVAC equipment if a receptacle outlet is located on the same level and within 75 feet.

OESC 210.71 Meeting Rooms. (Entire section: Not adopted by the State of Oregon)

OESC 225.30 **Number of Supplies.** A building or other structure that is served by a branch circuit or feeder on the load side of a service disconnecting means shall be supplied by only one feeder or branch circuit unless permitted in 225.30(A) through ~~(E)~~ **(F)**. For the purpose of this section, a multiwire branch circuit shall be considered a single circuit.

Where a branch circuit or feeder originates in these additional buildings or other structures, only one feeder or branch circuit shall be permitted to supply power back to the original building or structure, unless permitted in 225.30(A) through ~~(E)~~ **(F)**.

(F) One- or Two-Family Dwelling Unit(s). For a one- or two-family dwelling unit(s) with multiple feeders, it shall be permissible to install not more than six disconnects grouped at one location where the feeders enter the building, provided the feeder conductors originate at the same switchboard, panelboard, or overcurrent protection device location.

OESC 225.36 **Type of Disconnecting Means.** The disconnecting means specified in 225.31 shall be comprised of a circuit breaker, molded case switch, general use switch, snap switch, or other approved means. Where applied in accordance with 250.32(B), Exception No. 1, the disconnecting means shall be suitable for use as service equipment.

Exception:* *In single light pole installations that have the connections to the light pole circuit made in a location accessible only to qualified persons, recognized or certified in-line fuse holders shall be allowed, subject to special permission.

OESC 230.40 **Number of Service-Entrance Conductor Sets.**

Exception No. 3: *A one-family dwelling unit and its accessory structures shall be permitted to have one set of service-entrance conductors run to each from a single service drop, set of overhead service conductors, set of under-ground service conductors, or service lateral.* ***When there are continuous metallic paths bonded to the grounding system in the buildings involved, a disconnect, a grounded conductor and an equipment grounding conductor shall be installed to meet the provisions of Article 225, 230, and 250.***

OESC 230.43 **Wiring Methods for 1000 Volts, Nominal, or Less.**

Exception: Items (13) and (15) are limited to traffic control devices and highway lighting poles.

OESC 230.70 **(A)(1) Readily Accessible Location.**

Exception:* *In existing installations where the service panel or meter base is being replaced, the panel and service disconnecting means may remain at the existing location if the following conditions exist:

(1) The existing service conductors are of sufficient ampacity to supply the load or the existing conduit is large enough to accommodate new conductors that are of sufficient size to supply the load.

(2) All requirements of 110.26 and 240.24 are met. If the installation was made prior to July 1, 1996, the provisions of 240.24 (F) do not apply.

OESC 230.95 **(C) Performance Testing.** The ground-fault protection system shall be performance tested when first installed on site. This testing shall be conducted by ~~a qualified person(s)~~ **persons having proper training and experience required to perform and evaluate the results of such performance testing,** ~~using a test process of primary current injection,~~ in accordance with instructions that shall be provided with the equipment. A written record of this testing shall be made, **signed by the person(s) performing this test,** and shall be available to the authority having jurisdiction.

OESC 250.24 Grounding Service-Supplied Alternating-Current Systems.

(A)(1) General.

Informational Note: See definitions of *Service Conductors, Overhead; Service Conductors, Underground; Service Drop;* and *Service Lateral* in Article 100.

Exception: When the electric utility has installed a ground fault protection system ahead of the customer's service equipment, no bonding or electrical connection from the grounding electrode system shall be made to the grounded service conductor on the load side of the utility ground fault sensing device. The neutral or grounded service conductor, however, shall be grounded on the line side of the first ground fault sensor in a manner otherwise required at the customer's service equipment. The grounding electrode conductor shall be run to an equipment grounding bus or terminal at the service equipment as long as the equipment grounding conductor and the grounded neutral conductor are not connected to each other at this point. The on-site ground fault test required by 230.95 shall not be performed prior to the above installation requirements. Warning signs shall be installed.

(B) Main Bonding Jumper.

Exception No. 3: When the electric utility has installed a ground fault protection system ahead of the customer's service equipment and if the operation of the ground fault system relies on the absence of the main bonding jumper at the service equipment but includes an otherwise satisfactory main bonding jumper as a part of its sensing device, the main bonding jumper shall not be installed at the service equipment which would otherwise bond the grounded service conductor to the equipment ground. The on-site ground fault test required by 230.95 shall not be performed prior to the above installation requirements. Warning signs shall be installed.

OESC 250.32 (B)(1) Grounded Systems Supplied by a Feeder or Branch Circuit.

Exception No.1: For ***existing and new*** *installations made in compliance with* ~~*previous editions*~~ ***the 2005 edition*** *of this Code that permitted such connection, the grounded conductor run with the supply to the building or structure shall be permitted to serve as the ground-fault return path if all of the following requirements continue to be met:*

OESC 250.52 (A) Electrodes Permitted for Grounding.

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

(1) One or more bare or zinc galvanized or other electrically conductive coated steel reinforcing bars or rods of not less than 13 mm (½ in.) in diameter, installed in one continuous 6.0 m (20 ft) length, or if in multiple pieces connected together by the usual steel tie wires, exothermic welding, welding, or other effective means to create a 6.0 m (20 ft) or greater length; or

(2) Bare copper conductor not smaller than 4 AWG

Metallic components shall be encased by at least 50 mm (2 in.) of concrete and shall be located horizontally within that portion of a concrete foundation or footing that is in direct contact with the earth or within vertical foundations or structural components or members that are in direct contact with the earth. If multiple concrete-encased electrodes are present at a building or structure, it shall be permissible to bond only one into the grounding electrode system. **When an addition is remote from the service and the integrity of the grounding electrode system has been verified, connection of the remote concrete encased electrode is not required.**

(B) Not Permitted for Use as Grounding Electrodes.

(4) In existing electrical installations, when a service change or upgrade occurs, an existing metal underground water pipe shall not be used unless the metal underground water pipe has been verified as suitable for continued use as a grounding electrode. An existing metal underground water pipe shall be bonded to the new grounding electrode system as required by 250.104(A).

OESC 250.53 **(A)(2) Supplemental Electrode Required.**

Effective: Oct. 1, 2020

Exception ***No. 1***: If a single rod, pipe, or plate grounding electrode has a resistance to earth of 25 ohms or less, the supplemental electrode shall not be required.

Exception No. 2: A supplemental electrode shall not be required for a single-phase, 200 amp or less temporary service.

OESC 250.94 **Bonding for Communication Systems.** Communications system bonding terminations shall be connected in accordance with (A) or (B).

(A) The Intersystem Bonding Termination Devices. An intersystem bonding termination (IBT) **or exposed and supported length of #6 bare copper conductor** connecting intersystem bonding conductors shall be provided external to enclosures at the service equipment or metering equipment enclosure and at the disconnecting means for any additional buildings or structures. If an IBT is used it shall comply with the following:

OESC 250.118 **Types of Equipment Grounding Conductors.** The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

(14) Surface metal raceways listed for grounding.

Where metallic conduit is installed on roof tops, an equipment grounding conductor shall be provided within the raceway and sized per 250.122.

OESC 300.5 **(G) Raceway Seals.** Conduits or raceways through which moisture may contact live parts shall be sealed or plugged at either or both ends. Spare or unused raceways shall also be sealed. ~~Sealants shall be identified for use with the cable insulation, conductor insulation, bare conductor, shield, or other components.~~

OESC 320.30 **(A) General.** Type AC cable shall be supported and secured by staples; cable ties ~~listed and identified for securement and support~~; straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable.

OESC 328.30 **Support.** Type MV cable terminated in equipment or installed in pull boxes or vaults shall be secured and supported by metallic or nonmetallic supports suitable to withstand the weight by cable ties ~~listed and identified for securement and support~~, or other approved means, at intervals not exceeding 1.5 m (5 ft) from terminations or a maximum of 1.8 m (6 ft) between supports.

OESC 330.30 **Securing and Supporting.**

(A) General. Type MC cable shall be supported and secured by staples; cable ties ~~listed and identified for securement and support~~; straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable.

OESC 334.12 **Uses Not Permitted.**

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

(2) Exposed within a dropped or suspended ceiling cavity in other than one- and two-family and multifamily dwellings.

Exception to (2): Types NM, NMC, and NMS cables may be installed within a dropped or suspended ceiling cavity in structures other than one- and two-family and multifamily dwellings when installed in accordance with 334.15.

OESC 334.15 **Exposed Work**

(B) Protection from Physical Damage. Cable shall be protected from physical damage where necessary by rigid metal conduit, intermediate metal conduit, electrical metallic tubing, Schedule 80 PVC conduit, type RTRC marked with the suffix –XW, or other approved means. Where passing through a floor, the cable shall be enclosed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, Schedule 80 PVC conduit, type RTRC marked with the suffix –XW, or other approved means extending at least 150 mm (6 in.) above the floor.

Type NMC cable installed in the shallow chases or grooves in masonry, concrete, or adobe, shall be protected in accordance with the requirements in 300.4(F) and covered with plaster, adobe, or similar finish.

Exposed nonmetallic sheathed cable shall be protected where it is installed horizontally less than 8 feet above the floor. Exposed nonmetallic sheathed cable less than 8 feet above the floor that enters the top or bottom of a panel board shall be protected from physical damage by conduit, raceway, ½-inch plywood or ½-inch drywall.

(C) In Unfinished Basements ~~and Crawl Spaces~~. Where cable is run at angles with joists in unfinished basements ~~and crawl spaces~~**,** it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edge of the joists. Smaller cables shall be run either through bored holes in joists or on running boards. Nonmetallic-sheathed cable installed on the wall of an unfinished basement shall be permitted to be installed in a listed conduit or tubing or shall be protected in accordance with 300.4.

OESC 334.30 **Securing and Supporting.** Nonmetallic-sheathed cable shall be supported and secured by staples; cable ties ~~listed and identified for securement and support~~; or straps, hangers, or similar fittings designed and installed so as not to damage the cable, at intervals not exceeding 1.4 m (4 1⁄2 ft) and within 300 mm (12 in.) of every cable entry into enclosures such as outlet boxes, junction boxes, cabinets, or fittings. Flat cables shall not be stapled on edge.

OESC 336.10 **Uses Permitted.** Type TC cable shall be permitted to be used as follows:

(9) ~~In one- and two-family dwelling units,~~ **For generators and HVAC systems**, type TC-ER cable containing both power and control conductors that is identified for pulling through structural members shall be permitted. Type TC-ER cable used as interior wiring shall be installed per the requirements of Part II of Article 334.

Exception: *Where used to connect a generator and associated equipment having terminals rated 75°C (140°F) or higher, the cable shall not be limited in ampacity by 334.80 or 340.80.*

OESC 348.30 **(A) Securely Fastened.** FMC shall be securely fastened in place by an approved means within 300 mm (12 in.) of each box, cabinet, conduit body, or other conduit termination and shall be supported and secured at intervals not to exceed 1.4 m (41⁄2 ft). ~~Where used, cable ties shall be listed and be identified for securement and support.~~

OESC 350.30 **(A) Securely Fastened.** LFMC shall be securely fastened in place by an approved means within 300 mm (12 in.) of each box, cabinet, conduit body, or other conduit termination and shall be supported and secured at intervals not to exceed 1.4 m (4 1⁄2 ft). ~~Where used, cable ties shall be listed and be identified for securement and support.~~

OESC 356.30 **356.30 Securing and Supporting.** Type LFNC shall be securely fastened and supported in accordance with one of the following:

(1) Where installed in lengths exceeding 1.8 m (6 ft), the conduit shall be securely fastened at intervals not exceeding 900 mm (3 ft) and within 300 mm (12 in.) on each side of every outlet box, junction box, cabinet, or fitting. ~~Where used, cable ties shall be listed as suitable for the application and for securing and supporting.~~

OESC 362.30 **(A) Securely Fastened.** ENT shall be securely fastened at intervals not exceeding 900 mm (3 ft). In addition, ENT shall be securely fastened in place within 900 mm (3 ft) of each outlet box, device box, junction box, cabinet, or fitting where it terminates. ~~Where used, cable ties shall be listed as suitable for the application and for securing and supporting.~~

OESC 394.12 **Uses Not Permitted.** Concealed knob-and-tube wiring shall not be used in the following:

(5) Hollow spaces of walls, ceilings, and attics where such spaces are insulated by loose, rolled, or foamed-in-place insulating material that envelops the conductors

Exception: The provisions of 394.12 shall not be construed to prohibit the installation of loose or rolled thermal insulating materials in spaces containing existing knob-and-tube wiring, provided all the following conditions are met:

(1) The visible wiring shall be inspected by a certified electrical inspector or a general supervising electrician employed by a licensed electrical contractor.

(2) All defects found during the inspection shall be repaired prior to the installation of insulation.

(3) Repairs, alterations or extensions of or to the electrical systems shall be inspected by a certified electrical inspector.

(4) The insulation shall have a flame spread rating not to exceed 25 and a smoke density not to exceed 450 when tested in accordance with ASTM E84-91A 2017 Edition. Foamed in place insulation shall not be used with knob-and-tube wiring.

(5) Exposed splices or connections shall be protected from insulation by installing flame resistant, non-conducting, open top enclosures which provide three inches, but not more than four inches side clearances, and a vertical clearance of at least four inches above the final level of the insulation.

(6) All knob-and-tube circuits shall have overcurrent protection in compliance with the 60 degree C column of Table 310.15(B)16 of NFPA 70-2017. Overcurrent protection shall be either circuit breakers or type S fuses. The type S fuse adapters shall not accept a fuse of an ampacity greater than permitted in 240.53.

OESC 400.10 **(A) Uses.** Flexible cords and flexible cables shall be used only for the following:

(12) Listed assemblies of fixtures and controllers, approved by the Federal Aviation Administration.

OESC 400.12 **(5) Uses not permitted.**

***Exception No. 1** to (5): Flexible cord and flexible cable shall be permitted if contained within an enclosure for use in other Spaces Used for Environmental Air as permitted by 300.22(C)(3).*

Exception No. 2 to (5): Cord sets and power-supply cords shall be permitted above accessible suspended or dropped ceilings, if part of a listed assembly, other than a luminaire, and the cord length does not exceed 1.8m (6 ft).

OESC 406.4 **(D) Replacements.**

(4) Arc-Fault Circuit Interrupter Protection. (Not adopted by the State of Oregon)

OESC 406.12 **Tamper-Resistant Receptacles.** All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the areas specified in 406.12(1) through **(4) and** (7) shall be listed tamper-resistant receptacles. **(406.12(5) and (6) not adopted by the State of Oregon)**

OESC 422.34 **Unit Switch(es) as Disconnecting Means.** A unit switch(es) with a marked-off position that is a part of an appliance and disconnects all ungrounded conductors shall be permitted as the disconnecting means required by this article where other means for disconnection are provided in occupancies specified in 422.34 (A) through (D). **Unit switches on ranges, ovens and dishwashers shall not be considered the disconnect required by this section.**

OESC 500.8 **Equipment.**

(A) Suitability. "Suitability of identified equipment" ~~shall be determined by one of the following:~~ **as used in 500.8 (A) means that equipment meets the requirements of ORS 479.760.**

~~(1) Equipment listing or labeling~~
~~(2) Evidence of equipment evaluation from a qualified testing laboratory or inspection agency concerned with product evaluation~~
~~(3) Evidence acceptable to the authority having jurisdiction such as a manufacturer's self-evaluation or an owner's engineering judgment.~~

~~Informational Note: Additional documentation for equipment may include certificates demonstrating compliance with applicable equipment standards, indicating special conditions of use, and other pertinent information. Guidelines for certificates may be found in ANSI/ISA 12.00.02, *Certificate Standard for AEx Equipment for Hazardous (Classified) Locations.*~~

OESC 517.13 Effective Oct. 1, 2020 **(A) Wiring Methods.**

Exception: Type PVC conduit may be installed underground or embedded in concrete in Dental Clinics located in type B occupancies, provided that a wire type equipment grounding conductor is installed to meet the requirements of 250.118 and a separate insulated equipment grounding conductor is installed to meet the requirements of 517.13(B).

OESC 517.10 **Applicability.**

(A) Applicability. Part II shall apply to patient care space of all health care facilities.

(B) Not Covered. Part II shall not apply to the following:

(1) Business offices, corridors, waiting rooms, and the like in clinics, medical and dental offices, and outpatient facilities.
(2) Areas of nursing homes and limited care facilities wired in accordance with Chapters 1 through 4 of this *Code* where these areas are used exclusively as patient sleeping rooms.
(3) **Health care facilities located in Type B Occupancies as defined by the *Oregon Structural Specialty Code (OSSC)* used exclusively for any of the following purposes:**

a. Intramuscular Injections (Immunizations)
b. Psychiatry and Psychotherapy
c. Massage Therapy
d. Physical Therapy
e. Opticians and Optometrists
f. Acupuncture
g. Audiology
h. Chiropractic Therapy

OESC 547.5 **(G) Receptacles.** All 125-volt, single phase, 15- and 20-ampere general-purpose receptacles installed in the locations listed in (1) through (4) shall have ground-fault circuit-interrupter protection:

GFCI protection shall not be required for a single receptacle supplying a dedicated load and marked "not GFCI protected". A GFCI protected receptacle shall be located within 900 mm (3 ft) of the non-GFCI protected receptacle.

OESC 547.10 **Equipotential Planes and Bonding of Equipotential Planes.** The installation and bonding of equipotential planes shall comply with 547.10(A) and (B). For the purposes of this section, the term *livestock* shall not include poultry.

(A) Where Required. Equipotential planes shall be installed where required in (A)(1) and (A)(2).

(1) Indoors. Equipotential planes shall be installed in confinement areas with concrete floors where metallic equipment is located that may become energized and is accessible to livestock.

(2) Outdoors. Equipotential planes shall be installed in concrete slabs where metallic equipment is located that may become energized and is accessible to livestock.

The equipotential plane shall encompass the area where the livestock stands while accessing metallic equipment that may become energized.

Exception to (A)(1) and (A)(2): Where the electrical system is designed by a professional engineer, as defined in ORS 672.002(2), and the electrical equipment is isolated and not accessible to livestock, and non-electrical metallic equipment is not likely to become energized.

OESC 620.1 **Scope.** This article covers the installation of electrical equipment and wiring used in connection with elevators, dumbwaiters, escalators, moving walks, platform lifts, and stairway chairlifts.

Informational Note No. 1: For further information, see ~~ASME A17.1-2010/CSA B44-10, Safety code for Elevators and Escalators.~~ **the *Oregon Elevator Specialty Code* as adopted in OAR chapter 918, division 400.**

OESC 620.2 **Definitions.**

Separate Branch Circuit. A circuit dedicated solely for the purpose intended without other devices, systems or equipment connected to the circuit.

OESC 620.5 **Working Clearances.** Working space shall be provided about controllers, disconnecting means, and other electrical equipment in accordance with 110.26(A).

Where conditions of maintenance and supervision ensure that only qualified persons examine, adjust, service, and maintain the equipment, the clearance requirements of 110.26(A) shall not be required where any of the conditions in 620.5(A) through (D) are met. **Where machine room doors swing inward, the arc of the door shall not encroach on those clearances required by 110.26(A).**

OESC 620.11 **Insulation of Conductors.** The insulation of conductors shall comply with 620.11(A) through (D).

(A) Hoistway Door Interlock Wiring. The conductors to the hoistway door interlocks from the hoistway riser shall be shall be one of the following:

(1) Flame retardant and suitable for temperature of not less than 200°C (392°F). Conductors shall be Type SF or equivalent.
(2) Physically protected using an approved method, such that the conductor assembly is flame retardant and suitable for a temperature of not less than 200°C (392°F).

Exception: Where not required by the Oregon Elevator Specialty Code (ASME A17.1).

OESC 620.37 Wiring in Hoistways, Machine Rooms, Control Rooms, Machinery Spaces, and Control Spaces.

(A) Uses Permitted. Only such electrical wiring, raceways, and cables used directly in connection with the elevator or dumbwaiter, including wiring for signals, for communication with the car, for lighting, heating, air conditioning, and ventilating the elevator car, for fire detecting systems, for pit sump pumps, and for heating, lighting, and ventilating the hoistway, shall be permitted inside the hoistway, machine rooms, control rooms, machinery spaces, and control spaces.

Conduits and raceways necessary for the connection of such devices shall only enter hoistways and machine rooms to the extent necessary to connect the devices(s) attached thereto.

OESC 620.51 Disconnecting Means.

(B) Operation. No provision shall be made to open or close this disconnecting means from any other part of the premises. If sprinklers are installed in hoistways, machine rooms, control rooms, machinery spaces, or control spaces, the disconnecting means shall be permitted to automatically open the power supply to the affected elevator(s) prior to the application of water. No provision shall be made to automatically close this disconnecting means. Power shall only be restored by manual means.

When provided, this disconnecting means shall be located in the elevator control room or control space. The installation shall comply with the requirements of NFPA 72 as adopted in OAR 918-306-0005.

(C) Location. The disconnecting means shall be located where it is readily accessible to qualified persons.

Where machine rooms are provided, the disconnecting means required by 620.51 shall be located within 610 mm (24 inches) of the open side of the machine room access door. Where more than one disconnect is required for a multi-car group, the disconnects shall be adjacent to each other with the first disconnect located within 610 mm (24 inches) of the open side of the machine room access door. Measurement shall be taken from the edge of the disconnect nearest the machine room door.

(C)(4) On Platform Lifts and Stairway Chairlifts. On platform lifts and stairway chairlifts, the disconnecting means shall be located within sight of the motor controller **or lift and within 1.83 m (six feet) of the motor controller. The disconnecting means shall not be located in the runway enclosure**.

(C)(5) Residential installations. A disconnecting means shall be required to be placed within sight of the controller or lift. Where such devices are supplied with flexible cord and plug type connectors, the supply receptacle shall be switched by the disconnecting means. The disconnecting means does not require overcurrent protection, provided such protection is supplied by the branch circuit overcurrent device. In all other respects the disconnecting means shall comply with the requirements of this section.

OESC 620.86 Flexible Metal Conduit. Where flexible metal conduit is utilized between the disconnecting means specified in 620.51 and the elevator controller, an equipment grounding conductor shall be provided within the raceway and sized per 250.122 and Table 250.122.

OESC 645.2 Critical Operations Data System. An information technology equipment system that **has been designated by the building owner as** ~~requires~~ **requiring** continuous operation. ~~for reasons of public safety, emergency management, national security, or business continuity.~~

OESC 645.10 Disconnecting Means. An approved means shall be provided to disconnect power to all electronic equipment in the information technology equipment room or in designated zones within the room. There shall also be a similar approved means to disconnect the power to all dedicated HVAC systems serving the room or designated zones and shall cause all required fire/smoke dampers to close. The disconnecting means shall **be grouped and identified and shall be readily accessible at the principal exit doors, or shall** comply with either 645.10(A) or (B).

OESC 670.6 **Surge Protection. (Not adopted by the State of Oregon)** ~~Industrial machinery with safety interlock circuits shall have surge protection installed.~~

OESC 680.42 **Outdoor Installations.**

(B) Bonding. [equipotential bonding not required where (1) through (4) are met:]

(4) (second sentence) The height of nonconductive external steps **or deck** for exit and entry . . .

OESC 690.12 **Rapid Shutdown of PV Systems on Buildings.**

PV system circuits installed on or in buildings shall include a rapid shutdown function to reduce shock hazard for emergency responders in accordance with 690.12(A) through (D). **Where an addition to an existing system on or in a building is installed, a rapid shutdown function shall be provided for the existing system(s) on or in the building.**

OESC 690.31 **Methods Permitted**

(G)(1) Embedded in Building Surfaces. ~~Where circuits are~~ **Circuit conductors shall not be** embedded in built-up, laminate, or membrane roofing materials in roof areas not covered by PV modules and associated equipment**.** ~~, the location of circuits shall be clearly marked using a marking protocol that is approved as being suitable for continuous exposure to sunlight and weather.~~

(G)(5) Beneath Roofs. Wiring methods shall not be installed within 45 cm (18 in.) of the roof decking or sheathing except where directly below the roof surface covered by PV modules and associated equipment. Circuits shall be run perpendicular to the roof penetration point to supports a minimum of 45 cm (18 in.) below the roof decking.

Informational Note: The 45 cm (18 in.) requirement is to prevent accidental damage from saws used by fire fighters for roof ventilation during a structure fire.

OESC 690.47 **Grounding Electrode System.**

Errata: January 2019

Where a grounding electrode conductor is required by 690.47(A) or (B), it shall not be smaller than 6AWG copper or 4 AWG aluminum.

OESC 700 **Emergency Systems**

Errata: January 2019

Building Officials and inspectors administering and enforcing the state building code under ORS 455.148 and 455.150, shall ensure compliance with Sections 700.32, 701.27, or 708.54 by verifying receipt of a certificate signed by the Engineer of Record or the Signing Supervisor stating that the proposed installation complies with the selective coordination requirements of this code.

OESC 700.3

Effective: Oct. 1, 2020

(F) Temporary Source of Power for Maintenance or Repair of the Alternate Source of Power. If ***the building owner deems it necessary and*** the emergency system relies on a single alternate source of power, which will be disabled for maintenance or repair, the emergency system shall include permanent switching means to connect a portable or temporary alternate source of power, which shall be available for the duration.

OESC 700.32 **Selective Coordination.** Emergency system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices.

For the purposes of this section, supply side overcurrent protection means those protective devices on the emergency system supply side and not on the normal power supply side. The protection shall be selectively coordinated using the higher of the normal power supply fault current levels or emergency system fault current levels. Overcurrent devices shall be selectively coordinated for .01 seconds and greater.

***Exception No. 1**: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.*

Exception No. 2: The requirements for selective coordination shall meet the coordination requirements in effect at the time of the original installation when the installation is being altered, maintained or repaired. The ground fault sensing function of overcurrent protective devices will only be required to selectively coordinate with the ground fault sensing functions of other protective devices.

OESC 701.27 **Selective Coordination.** Legally required standby system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices.

For the purposes of this section, supply side overcurrent protection means those protective devices on the emergency system supply side and not on the normal power supply side. The protection shall be selectively coordinated using the higher of the normal power supply fault current levels or emergency system fault current levels. Overcurrent devices shall be selectively coordinated for .01 seconds and greater.

***Exception No. 1**: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.*

Exception No. 2: The requirements for selective coordination shall meet the coordination requirements in effect at the time of the original installation when the installation is being maintained, altered or repaired. The ground fault sensing function of overcurrent protective devices will only be required to selectively coordinate with the ground fault sensing functions of other protective devices.

OESC 702.4 **Capacity and Rating.**

(2) Automatic Transfer Equipment. Where automatic transfer equipment is used, an optional standby system shall comply with (2)(a) or (2)(b).

(a) **Full Load.** The standby source shall be capable of supplying the full load that is transferred by the automatic transfer equipment.

(b) **Load Management.** Where a system is employed that will automatically manage the connected load, the standby source shall have a capacity sufficient to supply the maximum load that will be connected by the load management system.

Exception: In one- and two-family dwellings manual management of the connected load shall be permitted.

OESC 708.1 **Scope.** The provisions of this article apply to the installation, operation, monitoring, control, and maintenance of the portions of the premises wiring system intended to supply, distribute, and control electricity to designated critical operations areas (DCOA) in the event of disruption to elements of the normal system.

Critical operations **areas and critical operations** power systems are ~~those systems so classed by municipal, state, federal, or other codes by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such a~~ **designated by the owner of the facility. A building official has no authority to designate or require designation of an area as requiring a critical operations power** system. ~~These~~ **Critical operations power** systems **can** include but are not limited to power systems, HVAC, fire alarm, security, communications, and signaling for designated critical operations areas.

OESC 708.54 **Selective Coordination.** Critical operations power system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices.

For the purposes of this section, supply side overcurrent protection means those protective devices on the emergency system supply side and not on the normal power supply side. The protection shall be selectively coordinated using the higher of the normal power supply fault current levels or emergency system fault current levels. Overcurrent devices shall be selectively coordinated for .01 seconds and greater.

***Exception No. 1**: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.*

Exception No. 2: The requirements for selective coordination shall meet the coordination requirements in effect at the time of the original installation when the installation is being maintained, altered or repaired. The ground fault sensing function of overcurrent protective devices will only be required to selectively coordinate with the ground fault sensing functions of other protective devices.

OESC 725.24 **Mechanical Execution of Work.** Class 1, Class 2, and Class 3 circuits shall be installed in a neat and workmanlike manner. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be supported by straps, staples, hangers, cable ties, or similar fittings designed and installed so as not to damage the cable. This installation shall also comply with 300.4~~**(D)**~~ **and 300.11.**

OESC 760.24 **Mechanical Execution of Work.**

(A) General. Fire alarm circuits shall be installed in a neat workmanlike manner. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be supported by straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4 ~~**(D)**~~ **and 300.11.**

OESC 760.41 **NPFLA Circuit Power Source Requirements**

(B) Branch Circuit. The branch circuit supplying the fire alarm equipment(s) shall supply no other loads. The location of the branch-circuit overcurrent protective devise shall be permanently identified at the fire alarm control unit. The circuit disconnecting means shall have red identification~~**, shall be accessible only to qualified personnel,**~~ and shall be identified as "FIRE ALARM CIRCUIT." The red identification shall not damage the overcurrent protective devices or obscure the manufacturer's markings. This branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit-interrupters.

OESC 760.121 Power Sources for PLFA Circuits

(B) Branch Circuit. The branch circuit supplying the fire alarm equipment(s) shall supply no other loads. The location of the branch-circuit overcurrent protective device shall be permanently identified at the fire alarm control unit. The circuit disconnecting means shall have red identification~~**, shall be accessible only to qualified personnel,**~~ and shall be identified as "FIRE ALARM CIRCUIT." The red identification shall not damage the overcurrent protective devices or obscure the manufacturer's markings. This branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit-interrupters.

OESC 770.24 Mechanical Execution of Work. Optical fiber cables shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4 ~~**(D) through (G)**~~ and 300.11.

OESC 770.48 Unlisted Cables Entering Buildings.

(B) Nonconductive Cables in Raceway. Unlisted nonconductive outside plant optical fiber cables shall be permitted to enter the building from the outside and shall be permitted to be installed in any of the following raceways:

(1) Intermediate metal conduit (IMC)
(2) Rigid metal conduit (RMC)
(3) Rigid polyvinyl chloride conduit (PVC)
(4) Electrical metallic tubing (EMT)
(5) Electrical Nonmetallic Conduit (ENT)

OESC 800.24 Mechanical Execution of Work. Communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4 ~~**(D)**~~ and 300.11.

OESC 820.24 Mechanical Execution of Work. Community television and radio distribution systems shall be installed in a neat and workmanlike manner. Coaxial cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cables will not be damaged by normal building use. Such cables shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4 ~~**(D)**~~ and 300.11.
