



# 2021 OREGON ELECTRICAL SPECIALTY CODE



**CODE ADOPTION**  
Technical model code review committee

December 2019

# 2021 Oregon Electrical Specialty Code

## Technical Model Code Review Committee Members

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# Highlights to electrical code changes in Oregon

- 2017 Oregon Residential Specialty Code (ORSC) Solar readiness
- 100 New definition for reconditioned equipment, amended
- 110.21 Oregon defined reconditioned equipment in new note.
- 230.67 Oregon did not adopt whole house surge protection.
- 230.85 Oregon did not adopt new residential disconnect
- 210.8 GFCI residential requirements mostly unchanged for 2021

# Highlights continued

- 210.8(F). GFCI for other than dwelling units, ***general purpose*** 240v single phase receptacle 50amp or less require GFCI.
- 250.32(B)(1) amendment removed that allowed 3 wire feeder to a separate building.
- 250.53 Except No. 2: A supplemental electrode shall not be required for a single-phase, 200 amps or less temporary service.  
(one rod)
- 517.13 Type PVC conduit may be installed underground in Dental Clinics located in type B occupancies, must install 2 grounding conductors.

# Solar Ready Amendment N1107.4 ORSC Amendment Summary:

These amendments revise the 2017 Oregon Residential Specialty Code (ORSC) to require that all new residential structures have a nonflexible metal raceway or installed wiring to facilitate future installation of solar panels.

This amendment applies to new detached one- and two-family dwellings and townhouses, as governed by the ORSC, submitted for building permit, on or after Oct. 1, 2020.

Installation of a 4S box within 24” of the service panel attached to a minimum  $\frac{3}{4}$ ” nonflexible metal raceway that terminates into an accessible attic space with a 4S box labeled “RESERVED FOR SOLAR.” Exception is for a #10 copper 3-wire with ground type MC cable in place of the raceway.

The appropriate electrical licenses are required to complete the installation and at least a Residential Electrical Inspector Certification (CAE) is required to inspect the installation.

# OAR 918-098-1025 Certification Requirements

Unless otherwise stated in this rule, every person who performs building official duties, building code inspections, or plan reviews must possess a valid Oregon Inspector Certification (OIC) and a valid appropriate Oregon Code Certification or authorization from the division for the work being performed.

## **OAR 918-098-4002**

**Flexibility after COVID-19 and the 2020 Wildfires, and in Anticipation of Future Emergencies**

**This class does not provide credit to any licensing continuing education requirement you may have.**

# **The 2021 OESC, Table 1-E And the 2020 National Electrical Code, (NFPA 70).**

The 2020 National Electrical Code (NEC), as amended by Oregon  
Is the 2021 Oregon Electrical Specialty Code (OESC).

With enforcement of the 2021 OESC also includes Oregon  
Administrative Rules (OAR), and Oregon Revised Statutes (ORS).

We will go over some of the OAR's and ORS's, so we can be  
familiar with and up to date on a few of the sections that get  
overlooked, misunderstood, or any changes that may have taken  
place.

## **ORS 455.040**

**State building code preempts local ordinances and rules:** The state building code ***Shall be applicable and uniform*** throughout this state and in all municipalities, and no municipality shall enact or enforce any ordinance, rule or regulation relating to the same matters encompassed by the state building code...

## **OAR 918-098-1900**

### **Corrective Notices—Cite-it Requirement**

In addition to any other requirements set forth in statute and rule, all building officials, inspectors, and plans examiners certified under Chapter 918-098, OAR 918-225-0540, 918-281-0020, 918-695-0400, and ORS 460.055 must include an exact reference to the applicable specialty code section, OAR, ORS, when issuing corrective notices. They must include a plain statement of facts upon which the citation for correction action is based.



## Other Electrical Codes in Use

OSHA's general industry electrical safety standards are published in Title 29 Code of Federal Regulations (CFR), Part 1910.302 through 1910.308 —Design Safety Standards for Electrical Systems, and 1910.331 through 1910.335 — Electrical Safety-Related Work Practices Standards. OSHA's electrical standards are based on the NFPA 70 (NEC) and NFPA 70E, Electrical Safety Requirements for Employee Workplaces.

Oregon OSHA: OAR 437, Division 3 construction subdivision K electrical OAR 437-003-0001 Adoption by Reference. In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations <https://osha.oregon.gov/OSHARules/div3/div3K.pdf>

## **As an inspector, what do we look for when inspecting a permitted project?**

When inspecting a project that has been permitted by an electrical contractor, look at the installation that the permit covers. Other code violations that are not part of the installers permit or work are the responsibility of the property owner, not the electrical contractor. Do not hold up a final on the electrical contractors permit for violations outside the scope of his permit. Those concerns need to be discussed with the property owner.

**OAR 918-271-0000**

### **Role of an Electrical Inspector.**

An electrical inspector shall inspect electrical installations and provide public information on the meaning or application of an electrical code provision, but shall not lay out work or act as a consultant for electrical contractors, property owners or users.

# OAR 918-271-0040

## Mandatory Inspection Practice

- (1) Electrical inspectors shall inspect and verify the appropriateness of the size, placement, protection, and termination of the following electrical installations. Inspectors shall note discrepancies and require correction of code violations pursuant to OAR 918-098-1900. ***Physical contact is not required to inspect the electrical installations listed.***
- (a) Service entrance conductors;
  - (b) Service equipment;
  - (c) Grounding electrode and grounding electrode conductor;
  - (d) Bonding;
  - (e) Overcurrent protection;
  - (f) Branch Circuits (f) Feeders and (h) Underground Installations.

## **OAR 918-271-0050**

# **Inspection of Secondary Considerations**

- (1) Electrical installations not specified by OAR 918-271-0040 are secondary items.
- (2) At least 30 percent of all secondary items at a job site shall be inspected using a sampling process that reviews all separate categories of secondary items. If code violations are found within the samples inspected, an additional ten percent of the secondary items shall be inspected.

## ORS 30.285 Personal Liability

**Public body shall indemnify public officers;  
Procedure for requesting counsel; extent of duty of state;  
Obligation for judgment and attorney fees.**

- (1) The governing body of any public body shall defend, save harmless and indemnify any of its officers, employees and agents, whether elective or appointive, against any tort claim or demand, whether groundless or otherwise, arising out of an alleged act of omission occurring in the performance of duty.
- (2) The provisions of subsection (1) of this section do not apply in case of *malfeasance in office or willful or wanton neglect of duty*.

## OAR 918-305-0000

### Existing Electrical Installations

Wiring installations in existing buildings in the State of Oregon that complied with the minimum electrical safety code standards, **National Electrical Code** or **Oregon Electrical Specialty Code** in effect **at the time of the installation** shall not be considered in violation of the current minimum Electrical Specialty Code standards, unless the use or occupancy of the building is changed requiring different methods, alterations, or additions.

***This may include older installations that were given special permission at the time of installation.***



## ORS 479.530 Definitions for ORS 479.510 to 479.945 and 479.995

(3) “Certified electrical product” means an electrical product that is certified under ORS 479.760 and is not decertified.

(10) “Electrical installations” Means the construction or installation of electrical wiring and the permanent attachment or installation of electrical products in or on any structure that is not itself an electrical product. “Electrical installations” also means *the maintenance or repair* of installed electrical wiring and permanently attached electrical products.

*Does not include fiber optics, because it uses light to transmit data.*



## **ORS 479.760**

### **Certification of electrical products; safety indicators.**

- (1) An electrical product may not be certified unless the product meets electrical product safety standards established in rule by concurrence of the Electrical and Elevator Board and the Director of the Department of Consumer and Business Services.

There are a few exceptions in ORS 479.540 for industrial products.

List of Oregon approved testing labs available on the BCD website.

# QUALIFYING ELECTRICAL PRODUCTS FOR SALE OR DISPOSAL IN OREGON OAR 918-306-0000

- (1) The rules in OAR 918-306-0000 to 918-306-0530 contain the different ways to qualify an electrical product for sale, disposal and installation in Oregon.
  - (2) Authority for rules.
    - (a) ORS 479.540 authorizes partial and complete product exemptions
    - (b) ORS 479.610 requires **products for sale** in Oregon be certified;
    - (c) ORS 479.730 authorizes creation of procedures for product certifications, administration and enforcement and field evaluation of electrical products.
- ORS 479.835 Recovery of purchase price of product not meeting laws.

## OAR 918-305-0030

### Other Codes or Publications that Impact Electrical Installations

Other codes and publications that impact electrical installations include, but are not limited to those listed below:

- (1) Chapter 9 of the Oregon Structural Special Code relating to fire protection systems and Chapter 3 of the Oregon Residential specialty Code relating to smoke alarm installations. Solar.
- (2) ORS 455.420 requiring individual meters for dwelling units.
- (3) **The Oregon Energy Efficiency Specialty Code.**
- (4) Chapter 16 and 17 of the Oregon Structural Specialty Code.
- (5) Publications and requirements of the serving utility.
- (6) Public Law 101-336 the Americans with Disabilities Act.
- (7) Chapter 11 of the Oregon Structural Specialty Code which relates to the Americans with Disabilities Act.

## 918-305-0030 Continued

(8) The interconnection of all net-metering facilities and solar photovoltaic systems operated as interconnected power production source.

(9) Oregon Manufactured Dwelling Installation Specialty Code.

(10) The electrical portions of the installation or product standards identified in OAR 918-306-0005.

(11) The installation requirements for electric vehicle ready parking facilities specified in OAR 918-020-0380.

This section indicates there may be other publications that impact electrical installations and are not limited to just these and is written in the OESC before the amendments.

## **OAR 918-305-0010**

### **Scope of the Electrical Specialty Code**

The **Electrical Specialty Code (OESC)** applies to all nonexempt electrical installations except as covered by the electrical provisions of the Oregon Residential Specialty Code and is inspected by an Electrical Specialty Code inspector.

## **OAR 918-305-0020**

### **Governing Codes**

The applicable **Electrical Specialty Code** for electrical installations and alterations is:

- (1) The Electrical Specialty Code provisions in effect at the earlier of a request for plan review or application for a permit; or
- (2) At the *option of the applicant*, the current OESC.

## Federal exemptions No. 93-38

### Structures on State, Federal, or Other Property

Are plan reviews, permits and inspections required for:

1. State-owned buildings on: *Yes*
  - a. State-owned property.
  - b. Privately owned property leased by the State.
2. Federally owned buildings on: *No*
  - a. Federally owned property.
  - b. Privately owned property leased by the federal government.
  - c. Municipally owned property leased by the federal government.
3. Buildings on Indian reservation land. *No*
4. Buildings on public utility property such as power companies, gas companies, etc. *Maybe*
5. Private- or State-owned buildings on leased federal lands. *Yes*
6. On leased public structures built on private property. *Maybe*

More info on the BCD website

**Table 1-E**  
**Effective April 1, 2021**  
**2021 Oregon Electrical Specialty Code**

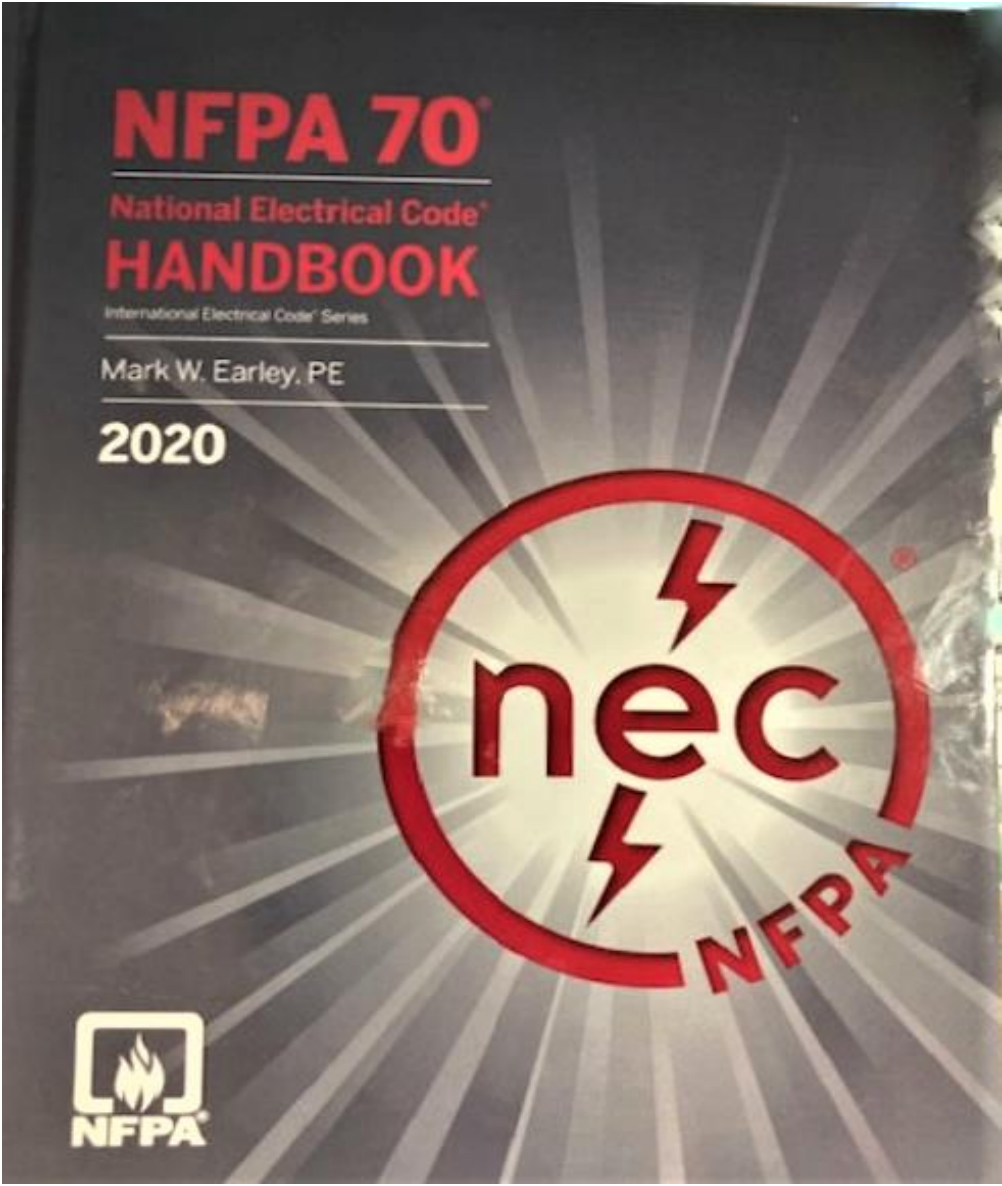
**Based on the 2020 edition of the**  
**National fire protection Association (NFPA) 70**  
**National Electrical Code (NEC)**

These amendments are in addition to code language and developed by the committee or the deletion of language contained in the NFPA 70 (NEC).

If it not listed in this table it has not been amended.

# Oregon Electrical Specialty Code (OESC)

Effective April 1, 2021





# Language Formatting

A Blue Underline or a ~~Red Strikethrough~~ = New Oregon Amendment.

A Black Underline or a ~~Strikethrough~~ = Existing Oregon Amendment.

Highlighted = New Model Code Language.

## 90.4 Enforcement....

By special permission, the authority having jurisdiction may wave 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, construction, or materials that comply with the most recent previous edition of this code adopted by the jurisdiction

Where the 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.

The occupancy classification and use designations shall be established in accordance with the Ore Structural Specialty Code (OSSC), as stated on the construction documents by the registered design professional and approved by the building official.

**Dormitory.** A space in a building where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories, or fraternity houses ( source OSSC)

**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)

**Reconditioned.** Electromechanical systems, equipment, apparatus, or components that are restored to operating conditions. This process differs from the normal servicing of equipment that remains within a facility, or replacement of listed equipment on a one-to-basis.

Informational Note [No.1](#): The term reconditioned is frequently referred to as rebuilt, refurbished, or remanufactured.

[Informational Note No. 2: Used equipment that has been inspected, tested, or repaired with listed or recognized components, is not considered to be reconditioned.](#)  
[Informational Note No.3; See ANSI EERS 2018.](#)

# Statewide Alternate Method

October 2020 No. 0802

## Underground Splicing of Equipment Grounding

Conductors for Traffic Signal Installations

(Ref.: ORS 455.060) Article 110.3(B)

**Subject:** To allow the splicing of multiple grounding conductors using crimp-type connectors.

**Conclusion:** This alternate method ruling applies only to copper equipment grounding conductors used for traffic signals and street lighting. A copper only barrel type connector shall be carefully selected for the proper die-less crimping tool is required. Inspectors shall verify the effectiveness of the connection by checking the crimp for loose conductors.

## 110.10

### **Circuit Impedance; Short-Circuit Ratings, and Other Characteristics.**

**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.*

Overcurrent devices should have a Short circuit current rating located on the device.



Note the 10,000-amp rating



## 110.14

**(D) Terminal Connection Torque.** Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value. The permit holder is not required to demonstrate compliance with this section.

## 110.21

**(A)(2) Reconditioned Equipment.....**

Informational Note No.4: Used equipment that has been inspected, tested, or repaired with listed or recognized components, is not considered to be *reconditioned*.

Informational Note No.5: See ANSI EERS 2018

## 110.24

### **(A) Field Markings....**

**Exception No. 1:** *A temporary service may be energized without demonstrating compliance with this section. 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. ~~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.~~*

# Statewide Code Interpretation

October 202 No. 08-02

Appliance Access – Attic and Underfloor.

OESC Section M1305.1.3 and M1305.1.4 , OESC 110.26

Subject: Appliance access – attic and underfloor

Answer: Section M1305 in the ORSC contains the appropriate provisions for the installations of mechanical equipment, including furnaces for dwellings regulated under the ORSC. The OESC workplace requirements in Article 110.26 relating to “electrical equipment’ are not applicable. 1

continued

No. 80-02 continued.

Specifically, Section M1305.1.3 regulates residential mechanical appliances installed in attics, and Section M1305.1.4 would regulate the installation of mechanical appliances in underfloor applications. In most cases these provisions require a level service space at least 30 inches deep and 30 inches wide on the side of the equipment where access is required.

240.10 Supplementary Overcurrent Protection. Where supplementary overcurrent protection is used for luminaires, appliances, and other equipment or for internal circuits and components of equipment, it shall not be used as a substitute for required branch-circuit over current devices or in place of the required branch-circuit protection. Supplementary overcurrent devices shall not be required to be readily accessible.

**110.26 (C)(3) Personnel Doors.** Where equipment rated 800 amperes 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 or ~~listed~~ fire exit hardware.

Informational Note: Additional construction requirements are located in [Section 1010.1.10](#) of the OSSC. This section governs panic hardware listing and installation requirements. The following OSSC are not part of this code but are provided here for the readers 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).

**110.26 (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 shall not be permitted to control all illumination within the working spaces. 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.

**110.31 (A)(4) Locks.** Doors shall be equipped with locks, and doors shall be kept locked, with access allowed only to qualified persons. Personnel doors shall open in the direction of egress and be equipped with ~~listed~~ panic hardware or ~~listed~~ fire exit hardware.

## 110.31 (A)(4) Continued.

[Informational Note: See the OESC Section 110.26\(C\)\(3\) amendment.](#)

**110.33 (A)(3) Personnel Doors.** Where 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 or ~~listed~~ fire exit hardware.

[Informational Note: See the OESC Section 110.26\(C\)\(3\) amendment.](#)



## **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 (F).

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

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

**210.8 (A) Dwelling Units.** All 125-volt, single phase, ~~through 250 volt~~ 15- and 20-ampere receptacles installed in the locations specified in 210.8(A)(1) through (A)(~~11-10~~) ~~and supplied by single phase branch circuits rated 150 volts to ground~~ shall have ground-fault circuit-interrupter protection for personnel.

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

***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.”*

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

## 210.8 Continued

**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 receptacle is labeled as “not GFCI protected.”

Receptacle(s) installed under the exception to 210.8(A)(2),(5)(6),(7), and (10) shall not be considered as meeting the requirements of 210.52(G).

(A)(11) ~~Not adopted by the State of Oregon. Indoor damp and wet locations.~~

**210.8 (B) Other than Dwelling Units.** All 125-volt single-phase, ~~through 250-volt~~ 15 –and 20-ampere receptacles ~~supplied by single phase branch circuits rated 150 volts or less to ground 50 amperes or less, and all receptacles supplied by three phase branch circuits rated 150 volts or less to ground, 100 amperes or less,~~ installed in the locations specified in 210.8(B)(1) through (B)(12) shall have ground-fault circuit-interrupter protection for personnel.

**(B)(6)** Indoor ~~damp and~~ wet locations.

**(B)(8)** Garages, ~~accessory buildings~~ service bays, and similar areas other than vehicle exhibition halls and showrooms.

## 210.8 Continued

**(B)(11)** Laundry areas.

*Exception to (11): GFCI protection shall not be required for a single receptacle serving an appliance or a duplex receptacle serving two appliance 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 receptacle is labeled as “not GFCI protected.”*

**(C) 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

## 210.8 Continued

**(E) Equipment Requiring Servicing.** GFCI protection shall be provided for the receptacles required by 210.63.

*Exception : Receptacles installed indoors in dwelling units shall not be required to be ground-fault circuit-interrupter protected, unless otherwise required.*

**(F) Outdoor Receptacle ~~Outlets.~~** All outdoor ~~outlets~~ general purpose receptacles for other than dwelling(s) units ~~other than those covered in 210.8(A)(3), Exceptions to (3)~~ that are supplied by single-phase branch circuits, rated at 150 volts to ground or less, 50 amperes or less, shall have ground-fault circuit-interrupter protection for personnel.

## 210.8 Continued

Informational Note: This requirement does not apply to specific use receptacles that are regulated by other sections in this code such as 551.71

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

**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:*** *AFCI protection shall not be required for an individual branch circuit supplying a fire alarm system installed in accordance with 760.41(B) or 760.121(B). The branch circuit shall be installed in a metal raceway, metal auxiliary gutter, steel-armored cable, Type MC or type AC, meeting the applicable requirements of 250.118, with metal boxes, conduit bodies, and enclosures.*



## 210.12 Continued

**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 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.*

**210.12 (B) Dormitory Units.** This section remained the same as the 2017 amendment with ~~bathrooms~~ being crossed out.

**(C) Guest rooms, Guest Suites, and Patient Sleeping Rooms in Nursing Homes and Limited-Care Facilities.**

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 and patient sleeping rooms in nursing homes and limited care facilities shall be protected by any of the means described in 210.12(A)(1) Through (6).~~

## 210.12 Continued

**(D) Branch Circuit Extensions or Modifications- Dwelling Units and Dormitory Units, ~~and Guest Rooms and Guest Suites.~~** Where branch circuit wiring for any of the areas specified in 210.12(A), or (B) ~~or~~ (C is not adopted), is modified, replaced, or extended, the branch circuit shall be protected by one of with the following:

- (1) By any of the means described in 210.12(A) through (A)(6)
- (2) A listed outlet branch-circuit type AFCI located at the first receptacle outlet of the existing branch circuit.

**Exception No.1: Extensions or modifications of existing circuits shall not require the installation of AFCI protection.**

## 210.12 Continue

*Exception No.2: Replacement or upgrading of a service or panelboard shall not require that existing circuits be protected by AFCI devices.*

~~*Exception: AFCI protection shall not be required where the extension of the existing branch circuit conductors is not more than 1.8 m (6 ft) and does not include any additional outlets or devices, other than splicing devices. This measurement shall not include the conductors inside an enclosure, cabinet, or junction box.*~~

**(C)(2) Island and Peninsular Countertops and work surfaces**

Receptacle outlets shall be installed in accordance with 210.52(C)(2)(a) and (C)(2)(b).

(a) At least one receptacle outlet shall be provided for ~~the first 0.84 sq. m ( 9 sq. ft ), or fraction thereof, of~~ the countertop or work surface. ~~A receptacle outlet shall be provided for every additional 1.7 sq. m (18 sq. ft), or fraction thereof, of the countertop or work surface.~~

(b) At least one receptacle outlet shall be located within 600 mm (2 ft) of the outer end of a peninsular countertop or permitted to be located as determined by the installer, designer, or building-

## 210.52 Continued

owner. The location of the receptacle outlets shall be in accordance with 210.52(C)(3).

~~A peninsular countertop shall be measured from the connected perpendicular wall.~~

**(D) Bathrooms.** Unless prohibited in 406.9(C), at least one receptacle outlet shall be installed in bathrooms within 900 mm (3 ft) of the outside edge of each basin...

***see amended 406.9(C) Bathtub and Shower Space.***

Receptacles shall not be installed within or directly above a bathtub or shower stall.

## 210.52 Continued

**(E) (3) Balconies, Decks, and Porches.** Balconies, decks, and porches that are within 102 mm (4 in.) horizontally of 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 ½ ft) above the balcony, deck, or porch walking surface.

**Exception No.1 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.**

**Exception No.2 to (3): Decks or porches located above grade level with a depth of 1 ft. or less are not required to have an additional receptacle installed.**





# Do these require a Receptacle?



**Juliette Balconies**



## 210.52 Continued

~~(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 sq. m(60 sq. ft) 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.

Alcove  
Depth 2 ft. Length minimum 3 ft.



## 210.63

### (A) 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.*

## 210.65

**Meeting Rooms.** Entire section: Not Adopted by Oregon.

## 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 connection to the light pole circuit made in a location accessible only to qualified person, recognized or certified in-line fuse holders shall be allowed, subject to special permission.*

# Statewide Code Interpretation

October 2020

No. 15-02

Service Requirements for Meter Bases on Poles or Post.

Article 230 and Article 250

Question: Does the attachment of a meter base on a pole set in the ground make the pole or post a “structure” triggering the requirements for installation of a service disconnect, overcurrent protection and a grounding electrode system under Article 230 and 250 of the *Oregon Electric Specialty Code. (OESC)*?

*Answer on next slide.*

Answer: No. The attachment of a meter base on a pole or post set in the ground does not constitute a “structure” for the purpose of the OESC. Furthermore, a meter base installed on a pole or post is not a service or service equipment, for the purposes of Article 230, and does not require the installation of a disconnect, overcurrent protection , or a grounding electrode system. The meter base enclosure must be properly bonded to the grounded conductor to ensure electrical continuity as required by Article 250.90. The conductors between the meter base and the service equipment are considered “service conductors,” defined as conductors from the service point to the service disconnecting means, in the OESC.

## 230.40

### Number of Service-Entrance Conductors Set...

***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.*



## 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.*

## 230.67

**Surge Protection.** Entire section: Not adopted by the State of Oregon.

## 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. (over steps)

## 230.71

**Maximum Number of Disconnects.** ~~Each service shall have only one disconnecting means unless the requirement of 230.71(B) are met:~~

**(A) General.** The service disconnecting means for each service permitted by 230.40, Exception No. 1,3,4,or 5, shall consist of not more than six switches or sets of circuit breakers, or a combination of not more than six switches and sets of circuit breakers, mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard or in switchgear. There shall be not more than six sets of disconnects per service grouped in any one location.

## 230.71 Continued

**(B) Two to Six Service Disconnecting Means.** Entire section: Not adopted by the State of Oregon.

**(B) Single-Pole Units.** Two or three single-pole switches or breakers, capable of individual operation, shall be permitted on multiwire circuits, one pole for each ungrounded conductor, as one multipole disconnect, provided they are equipped with identified handle ties or a master handle to disconnect all conductors of the service with no more than six operations of the hand.

Informational Note: See 408.36, Exception No. 1. and Exception No. 2 for service equipment in certain panelboards, and see 430.95 for service equipment in motor control centers.

**230.85** **Emergency Disconnects.** Entire section: Not adopted by the State of Oregon.

**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)~~ 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.

240.67

**(C)Performance Testing.** The arc energy reduction

protection system shall be performance tested ~~primary~~

~~current injection testing or another approved method~~ when first

installed on site. The testing shall be conducted by a ~~qualified~~

person(s) having proper training and experience required to

perform and evaluated the results of such performance testing,

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.

**240.87 (C) Performance Testing.** The arc energy reduction protection system shall be performance tested ~~primary current injection testing or another approved method~~ when first installed on site. The testing shall be conducted by a ~~qualified~~ person(s) having proper training and experience required to perform and evaluate the results of such performance testing, 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.

## 250.24 (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*



**250.24**

**Continued**

**(A)(1) Exception Continued:**

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.

## 250.24 (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 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.

**250.52 (A)(3) Concrete-Encased Electrode.** A concrete-encased electrode shall consist of at least 6.0 m (20 ft) of either (1) or (2).... (1 water pipe or 2 in-ground support structure)

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. Where an addition to a building or a structure is remote from the service and the integrity of the grounding electrode system has been verified,...

## 250.52

### Continued

connection of the remote concrete encased electrode is not required.

**(B) Not permitted for Use as Grounding Electrodes.** The following systems and materials shall not be used as grounding electrodes.

(1) Metal underground gas piping systems

(2) Aluminum

(3) The structures and structural reinforcing steel described in 680.26(B)(1) and (B)(2).

(4) In existing electrical installations, when a service change or upgrade occurs, an existing metal underground water pipe shall be bonded to the new grounding electrode system as required by 250.104(A).

**250.52**

**(B) Continued**

[Informational note: See Chapter 6 of the Oregon Plumbing Specialty Code.](#)

**250.53**

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

A single rod, pipe, or plate electrode shall be supplemented by an additional electrode of a type specified in 250.52(A)(2) through (A)(8). The supplemental electrode shall be permitted to be bonded to one of the following:

- (1) Rod, pipe, or plate electrode
- (2) Grounding electrode conductor
- (3) Grounded service-entrance conductor
- (4) Nonflexible grounded service raceway
- (5) Any grounded service enclosure

## 250.53 Continued

**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 amps or less temporary service*

## 250.94 (A) The intersystem Bonding Termination Devices.

An intersystem bonding jumper termination (IBT) or an exposed and supported length of #6 bare copper conductor for 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...

**OESC 250.94 Bonding for Other Systems.** An intersystem bonding termination or exposed and supported length of #6 bare copper conductor for connecting intersystem bonding conductors...



# Statewide Code Interpretation

October 2017

No. 08-04

## Bonding of Corrugated Stainless Steel Tubing

Code Section: OMSC Section C310

ORSC Section G2411.1 and G2412.1

OESC Article 250.104(B)

### Question:

1. When CSST is installed as a component of a gas piping system in a building regulated under the ORSC, is the customer or contractor required to comply with a manufacture's instruction that recommends bonding that is in addition to the bonding requirements under the OESC?



## Question:

2. When CSST is installed as a component of a gas piping system in a building *not regulated under the ORSC*, is the customer or contractor required to comply with the manufacture's instruction that recommends bonding that is in addition to the bonding requirements under the OESC or OMSC?

## Answer:

1. No. In residential applications, CSST installation instructions recommending bonding that is in addition to the OESC requirement for bonding of the gas piping system, is not a requirement in Oregon.

next slide

- Answer: 1. Gas piping systems that bonded in accordance with OESC Article 250.104(B) shall be considered to be adequately protected.
2. No. In commercial applications, CSST installation the instructions recommending bonding that is in addition to bonding requirements in OESC Article 250.104(B) or OMSC Section C310.1, is not a requirement in Oregon. Gas piping systems that are *bonded in accordance with OESC Article 250.104(B)* or OMSC Section C310.1 shall be considered to be adequately protected.

## 250.118

### Types of Equipment Grounding Conductors

**(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.

**440.9 Grounding and Bonding.** Where multimotor and combination-load equipment is installed outdoors on a roof, an equipment grounding conductor of the wire type shall be installed in outdoor portions of metallic raceway systems that use non-threaded fittings.

# Statewide Code Interpretation

October 17 NO. 15-01

## Grounding Frames of Ranges and Clothes Dryers From Existing Branch Circuits.

Code Section: Article 250.130 and Article 250.140

**Question:** In an existing occupancy, when is it required to replace an existing branch circuit serving a range or clothes dryer receptacle with a branch circuit containing an equipment grounding conductor?

**Answer:** If an existing branch circuit serving a range or clothes dryer receptacle is not equipped with an electrical grounding conductor, the existing branch circuit shall be

## No. 15-01 Continued

replaced with one containing an equipment grounding conductor in the following circumstances:

1. The new appliance has nameplate rating greater than ampere rating of the existing branch circuit: or,
2. The existing branch circuit and panelboard are readily accessible due to remodel or other circumstances allowing ready access.

It is not required to replace to the existing branch circuit in the following circumstances:

next slide

## No. 15-01 Continued

1. The new appliance is equipped with a cord and plug assembly suitable for the existing receptacle and the receptacle's grounding contacts are bonded to the appliance: or
2. The branch circuit extension is within 5 feet of the previous receptacle location and it is impractical to reach the panelboard: or
3. There is a service change resulting in the existing panelboard now being used as a subpanel. If this is the case, the grounded conductor terminal bar of the existing  
next slide

## No. 15-01 Continued

panelboard shall be isolated from the equipment grounding terminal bar of the existing panelboard shall be isolated from the equipment grounding terminal bar and the range and clothes dryer grounded conductor shall be relocated to the grounded conductor terminal bar. That portion of the uninsulated grounded conductor that is used for grounding existing ranges or clothes dryers shall be field insulated at points of access.

**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.~~



**300.9 Raceways in Wet Locations Abovegrade.** Where raceways are installed in wet locations above grade, the interior of these raceways shall be considered to be a wet location. Insulated conductors and cables installed in raceways in wet locations above grade shall comply with 310.10(C).

*Exception: The interior of raceways up to 8 ft. in length installed solely to provide physical protection shall not be considered a wet location.*

**311.40**      **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.

## 314.27 (C) Boxes at Ceiling-Suspended (Paddle) Fan Outlets..

~~Outlet boxes mounted in ceilings of habitable rooms of dwelling occupancies~~ Where spare, separately switched, ungrounded conductors are provided to a ceiling-mounted outlet box, in a location acceptable for the installation of a ceiling-suspended (paddle) fan in one-family, two family, or multifamily-dwellings, the outlet box or outlet box system shall be ~~comply~~ with one of the following (1) listed for the sole support of ceiling-suspended (paddle) fans.

~~(2) An outlet box complying with the applicable requirements of 314.27 and providing access to structural framing capable of supporting of a ceiling suspended (paddle) fan bracket or equivalent.~~

**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.

**330.30 (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.

**334.12 (A) Types NM and NMC.** Types NM and NMC 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 and NMC 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.*

**334.15 (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.

## 334.15 (B) Continued.

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, ½-drywall, or other approved means.

**(C) In Unfinished Basements and Crawl Spaces.** Where cable is run at angles with joist 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 joist. Smaller cables shall be run either-

## **334.15(C) Continued.**

through bored holes in joist or on running boards. Nonmetallic-sheath 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.

**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 ½ ft) and within 300 mm (12 in.) of every cable entry into enclosures such as outlet boxes, junction boxes, cabinets, or fittings.



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

~~(9) In one and two family dwelling units,~~ Type TC-ER-JP cable containing both power and control conductors shall be permitted for branch circuits and feeders. Type TC-ER-JP cable used as interior wiring shall be installed per the requirements of Part II of Article 334 and where installed as exterior wiring shall be installed per the requirements of part II of Article 340...

**337.30 Securing and Supporting.** Type P cable shall be supported and secured by 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.

**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 secure at intervals not to exceed 1.4 m (4 ½ ft). ~~Where used, cable ties shall be listed and be identified for securement and support.~~

**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 ½ ft). ~~Where used, cable ties shall be listed and be identified for securement and support.~~

### **356.30      Securing and Supporting....**

**(I)** 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.~~

**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.~~

**392.30 (B) Cables and Conductors.** Cables and conductors shall be secured to and supported by the cable tray system in accordance with (1), (2), and (3), ~~and (4)~~ as applicable:...

~~(4) Cable ties shall be listed and identified for the application and for securement and support.~~

**393.14 (A) General Requirements.** Support wiring shall be installed in a neat and workman like manner. Cables and conductors installed exposed on surface of ceilings and side-walls shall be supported by the building structure in such a manner that the cable is not damaged by normal building use. Such cables shall be supported by straps, staples, hangers, cable ties ~~listed and identified for securement and support~~, or similar fittings designed and installed so as not to damage the cable.

**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.*

## 394.12 Continued

(3) Repairs, alterations or extensions of or to the electrical system 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, nonconducting, 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.

*cont.*

(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.

#### **400.10(A) Uses permitted.**

**Flexible cords and flexible cables shall be used only for the following: (added)**

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

## 400.12 Cord: Uses not permitted.

**(5)** Where concealed by walls, floors, or ceilings or located above suspended or dropped ceilings

***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):*** *In other than Spaces Used for Environmental Air, 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 1.8 m (6 ft).*



## 406.4 (D)(4) Arc-Fault Circuit Interrupter Protection.

Not adopted by the State of Oregon.

## 406.9 (C) Bathtub and Shower Space. Receptacles shall not be installed within or directly above a bathtub or shower stall.

~~A zone measured 900 mm (3 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower threshold. The identified zone is all encompassing and shall include the space directly over the tub or shower stall.~~

~~**Exception:** In bathrooms with less than the required zone the receptacle(s) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.~~

**406.12 Tamper-Resistant Receptacles.** All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the areas specified in 406.12(I) though (4) and (7) shall be listed tamper-resistant receptacles. (406.12(5), (6) and (8) are not adopted by the State of Oregon.

- (1) Dwelling units, including attached and detached garages and accessory buildings to dwelling units, and common areas of multifamily dwellings in all areas specified in 210.52 and 550.13.
- (2) Guest rooms and guest suited of hotels, motels, and their common areas.
- (3) Child care facilities.
- (4) Preschools and elementary education facilities.
- ~~(5) Business offices, corridors, waiting rooms and the like in clinics medical and dental offices and outpatient facilities~~

## 406.12 Continued.

- ~~(6) Subset of assembly occupancies described in 518.2 to include places of waiting transportation, gymnasiums, skating rinks, and auditoriums.~~
- (7) Dormitories
- ~~(8) Assisted living facilities~~

## 408.8 Reconditioning of Equipment.

Reconditioning of equipment within the scope of this article shall be limited as described in 408.8(A) and (B). The reconditioning process shall use design qualified parts verified under applicable standards and be performed in accordance with any instructions provided by the manufacturer. If equipment has been damaged by fire, products of combustion, or water, it shall be specifically evaluated by its manufacturer, ~~or~~

a qualified testing laboratory, or the signing supervisor prior to being returned to service.

**(A) Panelboards.** Panelboards shall not be permitted to be reconditioned. This shall not prevent the replacement of a panelboard within an enclosure. ~~In the event the replacement has not been listed for specific enclosure and the available fault current is greater than 10,000 amperes, the completed work shall be field labeled, and any previously applied listing marks on the cabinet that pertain to the panelboard shall be removed.~~

**408.36 Overcurrent Protection.** In addition to the requirement of 408.30, a panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

*Exception No.1: Individual protection shall not be required for a panelboard used as service equipment with multiple disconnecting means in accordance with 230.71. In panelboards by three or more main circuit breakers or sets of fuses, the circuit breakers or sets of fuses shall not supply a second bus structure within the same panelboard assembly.*

## 408.36 Continued

**Exception No. 1:** *individual protection shall not be required for a panelboard protected on its supply side by two main circuit breakers or two sets of fuses ~~in other than service equipment,~~ having a combined rating not greater than that of the panelboard. A panelboard constructed or wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of determining the maximum of 42 overcurrent devices, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.*

**Exception No. 3:** *For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual resident occupancy.*

410.7

**Reconditioned Equipment.**

Not adopted by the State of Oregon.

410.69

**Identification of Control Conductor Insulation.**

Not adopted by the State of Oregon.

410.170

**General.** Luminaires complying with Parts I, II, III, IV, V, VI, VII, IX, X, XI, and XII of this article shall be permitted to be used for horticultural lighting. Part XVI shall additionally apply to lighting equipment specifically identified for horticultural use for evaluated in accordance with the UL Product Spec category IFAU.

**422.5 (A) General.** Appliances identified in 422.5(A)(1) through (A)(7) rated 150 volts or less to ground and 60 amperes or less, single- or 3-phase, shall be provided with Class A GFCI protection for personnel. Multiple Class A GFCI protective devices shall be permitted but shall not be required.

**(6)** Sump pumps and sewage pumps

*Exception to (6): Receptacle ground-fault protection shall not be required for a single receptacle if the receptacle is labeled as “not GFCI protected.”*

~~**(7) Dishwashers.**~~



# Statewide Code Interpretation

October 2017

No. 09-01

## HVAC System Disconnect Requirements

Code Section: Article 422.31, Article 440.3(B) & (C), and 430.109(B)

**Question:** Is a separate disconnecting means required at the indoor unit or component of a mini-split system?

**Answer:** Indoor components with a unit switch that complies with Article 424.19(C) or 422.34 are adequate to meet the intent of the OESC for personnel protection. If there is no switch on the indoor unit, Article 422.31 applies, and a lockable disconnect at the outdoor unit shall be permitted to serve as the disconnecting means.

**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.

**445.6 Listing (*Generators*).**  
Entire section: Not adopted by the State of Oregon.

**445.18 (D) Emergency Shutdown in One- and Two-Family Dwelling Units.** Not adopted by the State of Oregon.

**450.43 (C) Locks.** Doors shall be equipped with locks, and doors shall be kept locked, with access being allowed only to qualified persons. Personnel doors shall open in the direction of egress and be equipped with ~~listed~~ fire exit hardware.  
[Informational Note: See the OESC Section 110.26\(C\)\(3\) amendment.](#)

**480.10 (E) Egress.** Personnel doors intended for entrance to, and egress from, rooms designated as battery rooms shall open in the direction of egress and shall be equipped with ~~listed~~ panic or ~~listed~~ fire exit hardware.  
[Informational Note: See the OESC Section 110.26\(C\)\(3\) amendment.](#)

**490.49 Reconditioned Switchgear.** Switchgear, or sections of switchgear, within the scope of this article shall be permitted to be reconditioned. The reconditioning process shall use design qualified parts verified under applicable standards and be performed in accordance with any instructions provided by the manufacturer. Reconditioned switchgear shall be listed or field labeled as *reconditioned*, and previously applied listing mark, if any, within the portions reconditioned shall be removed. If equipment has been damaged by fire, products of combustion or water, it shall be specifically evaluated by its manufacturer, ~~or~~ a qualified testing laboratory, or the signing supervisor prior to being returned to service.

## 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 manufacture’s self evaluation or an owner’s engineering judgement.~~

## 500.8 Equipment. Continued

~~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*:~~

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

- (1) Business office, 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 I through 4 of this *code* where these areas are used exclusively as patient sleeping room
- (3) Areas used exclusively for any of the following purposes:
  - a. Intramuscular injections (immunizations)
  - b. Psychiatry and psychotherapy
  - c. Alternative medicine ([i.e. Acupuncture, Chiropractic therapy, etc.](#))
  - d. Optometry
  - e. [Massage therapy](#)
  - f. [Physical therapy](#)
  - g. [Audiology](#)

## 517.13 (A) Wiring Methods....

Exceptions: 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).

**517.17 (D) Testing.** When equipment ground-fault protection first installed, each level shall be performance tested to ensure compliance with 517.17(C). This testing shall be conducted by a ~~qualified person(s)~~ having proper training and experience required to perform and evaluate the results of such performance testing.



## 517.17 (D) Testing. Continued

using a test process in accordance with the instruction 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.

## 518.6 Illumination. Not adopted by the State of Oregon.

~~Illumination shall be provided for all working spaces about fixed service equipment, switchboards, switchgear, Panelboards, or motor control centers installed outdoors that serve assembly occupancies. Control by automatic means only shall not be permitted. Additional lighting outlets shall not be required where the workspace is illuminated by an adjacent light source.~~

**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.

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

**(1) Indoors.** Equipotential planes shall be installed in areas designated by the owner. Where installed ~~where required~~ equipotential planes shall comply with ~~in~~ 547.10(A)(1) & (2)

## 547.10 Continued

- (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.*

**Informational Note:** [See the definition of equipment Article 100](#)

## 555.35 (A)(3) Feeder and Branch-Circuit with GFPE. ...

*Exception **No.1** to (3): Transformer secondary conductors of a separately derived system that do not exceed 3 m (10 ft) and are installed in a raceway shall be permitted to be installed without ground-fault protection. This exception shall also apply to the supply terminals of the equipment supplied by the transformer secondary conductors.*

*Exception No. 2 to (3): Modifications to existing systems shall not require GFPE.*

## 590.8 Overcurrent Protective Devices.

**(A) Where reused.** Where overcurrent protective devices that have been previously used are installed in a temporary installation, these overcurrent protective devices shall be ~~examined to ensure these devices have been~~ properly installed, ~~properly~~ and maintained, ~~and there is~~ with no evidence of impending failure.

### **(B) Service Overcurrent Protective Devices.**

Not adopted by the State of Oregon. ~~Overcurrent protective devices for solidly grounded wye electrical services of more than 150 volts to ground but not exceeding 1000 volts phase to phase shall be current limiting.~~

**600.33 (B)(1)** Wiring shall be installed and supported 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 is not damaged by normal building use. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft). Such cables shall be supported by straps, staples, hangers, cable ties, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4D.

**620.1 Scope....**

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 OAR 918-400.

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

**620.5**      **Working Clearances....**

Where conditions of maintenance and supervision ensure that only qualified person examine, adjust, service, and maintain the equipment, the clearance requirements of 110.26(A) 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 clearance required by 110.26(A).

## 620.6 Ground-Fault Circuit-Interrupter protection for Personnel....

~~A permanently installed sump pump shall be permanently wired or shall be supplied by a single receptacle that is ground-fault circuit-interrupter protected.~~

A single receptacle supplying a permanently installed sump shall not require ground-fault circuit-interrupter protection.

**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 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 equal



## **620.11 Continued**

- (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).*

## **620.37 (A) Uses Permitted....**

Conduit 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.

**620.51 (B) Operations.** 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 provisions shall be made to automatically close this disconnecting means. Power shall only be restored by manual means.

Where 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 918-0005.

## 620.51 Continued.

**(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 disconnect 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-

## 620.51 Continued

or lift and within 1.83 m (6 ft.) of the motor controller. The disconnecting means shall not be located in the runway enclosure.

**(C)(5) Residential installation.** 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 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.

**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.

**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.~~

## 625.42 Rating....

Informational Note: See Statewide Alternate Method 09-01 for the use of a demand factor table for calculating electrical vehicle charging equipment services and feeders.



# ELECTRIC VEHICLE CHARGING



# Statewide Alternate method

October 2020

No. 09-01 Use of a Demand Factor Table for Calculating  
Electric Vehicle Charging Equipment Services and Feeders  
Article 625 ORS 455.060

Approval of the use of a demand factor table for calculating  
Electric Vehicle charging equipment services and feeders.

**Table 625.42 Demand Factors**

Number of charging stations	Sum of charging station ratings (%)
1-4	100
5-8	90
9-14	80
15-30	70
31-40	60
41-plus	50

**Notes:**

1. Where multiple charging stations are contained in a single enclosure, the demand factors in table 625.42 shall be permitted for each service and/or feeder supplying the multiple charging stations.
2. Where charging stations consist of only level 2 electric vehicle connectors and the demand factor of Table 625.42 are applied, the demand factor specified in 220.61(B) shall also be permitted.



**645.10 Disconnecting Means.** An approved means shall be provided to disconnect power to all electronic equipment in the informational technology equipment room or in designated zones within the room. There shall also be 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 disconnect means shall be grouped and identified and shall be readily accessible at the principal exit doors, or

**645.10 Continue**  
shall comply with either 645.10(A) or (B).

**670.6 Surge Protection.** Entire section: Not adopted by the State of Oregon. ~~Industrial machinery with safety interlock control devices not effectively protected from voltage surges on on the incoming supply circuit shall have surge protection installed.~~

**680.4 Inspection After Installation.** Not adopted by the State of Oregon. ~~The auauthority having jurisdiction shall be permitted to require perodic inspection and testing.~~

**680.21 (D) Pool Pump Motor Replacement.** Not adopted by the State of Oregon. ~~Where a pool pump motor in 680.21(C) is replaced for maintenance or repair, the replacement pump motor shall be provided with ground fault circuit interrupter protection.~~

**680.42 (B) Bonding.** { equipotential bonding not required where (1) through (4) are met:}

(4) The top rim of the spa or hot tub shall be at least 710 mm (28 in.) above all perimeter surfaces that are within 760 mm (30 in.), measured horizontally from the spa or hot tub. The height of nonconductive external steps or deck for exit and entry to or exit from the self-contained spa shall not be used to reduce or increase this rim height measurement.

**682.15 Ground-Fault Protection.** The GFCI requirements in this article, unless otherwise noted, shall be in addition to the requirements in 210.8. Ground-fault protection shall be provided in accordance with 682.15(A) and (B). The protection device shall be located not less than 300 mm (12 in.) above the established electrical datum plane.

**(A) Outlets.** Not adopted by the State of Oregon. ~~Outlets supplied by branch circuits not exceeding 150 volts to ground and 60 amperes, single-phase, shall be provided with ground-fault circuit interrupter protection for personnel.~~

**(B) Feeder and Branch Circuit on Piers.** Feeders and branch-circuit conductors that installed on piers shall be provided with ground-fault protection not exceeding 100 ~~30~~ mA. Coordination with downstream ground-fault protection shall be permitted at the feeder overcurrent protective device.

## **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 firefighters in accordance with 690.12(A) through (D). Where an addition to an existing system(s) on or in a building is installed, a rapid shutdown function shall be provided for the existing system(s) on or in the building. The provisions of 690.12(B)(2) shall not apply to the existing system(s).

## **690.47 Grounding Electrodes and Grounding Electrode**

**Conductors.** Additional grounding electrodes shall be to be installed in accordance with 250.52 and 250.54. Grounding shall be permitted to be connected directly to the PV module frame(s) or support structure.

## 690.47 Grounding Electrodes and Grounding Electrode Conductors.

Additional grounding electrodes shall be permitted to be installed in accordance with 250.52 and 250.54. Grounding shall be permitted to be connected directly to the PV module frame(s) or support structure. A grounding electrode conductor shall be sized according to 250.66, and shall not be smaller than 6 AWG copper or 4 AWG aluminum....

**700**

## **Emergency Systems.**

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.

**700.3**

### **(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-**

## 700.3 Continued

permanent switching means to connect a portable or temporary alternate source of power, which shall be available for the duration....

**700.32 Selective Coordination.** Emergency system(s) overcurrent devices shall be selective 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-



## 700.32 Continued.

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 requirement 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.*

**701.32 Selective Coordination.** Legally required standby system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices. For the purpose 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.***

## 701.32 Continued.

**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.*

## 702.4 (B)(2) Automatic Transfer Equipment....

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

**702.7 (A) Standby.** A sign shall be placed at the service-entrance equipment ~~for commercial and industrial installations~~ that indicates the type and location of each on-site optional standby source. A sign shall not be required for individual unit equipment for standby illumination. ~~For one and two family dwelling units, a sign shall be placed at the disconnecting means required in 230.85 that indicates the location of each permanently installed on site optional stand by power source disconnect or means to shut down the prime mover as required in 44518(D).~~

**708.1 Scope.** ...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 systems. ~~These~~ Critical operations power system can include but are not limited to power systems, HVAC, fire alarm security, communications, and signal for designated critical operations areas.

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

## 708.54 Continued

**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 over-current protective devices will only be required to selectively coordinate with the ground fault sensing functions of other protective devices.*

## **725.24 Mechanical Execution of Work. Class 1, Class 2, and**

Class 3 circuits shall be installed in a neat and workman like 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 to damage the cable. This installation shall also comply with 300.4 and 300.11



**760.24 (A) [ Mechanical Execution of Work] General.** Fire alarm circuits shall be installed in a neat like 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 damage 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 and 300.11.

**760.41 (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 marking. This branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit circuit-interrupters.

**760.121 (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 only to qualified personnel,~~ and shall be identified as “ FIRE ALARM CIRCUIT.” The red identification shall not be supplied through ground-fault circuit interrupters or arc-fault circuit-interrupters

**770.48 (B) Nonconductive Cables in Raceways.** 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)

# Thank You

2021 OESC Updated Changes Complete