ANSWER SHEET • 2021 ELECTRICAL RULE & LAW • OREGON

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1.	A B C D	26.	A B C D	51.	A B C D	76.	A B C D
2.	A B C D	27.	A B C D	52.	A B C D	77.	A B C D
3.	A B C D	28.	A B C D	53.	A B C D	78.	A B C D
4.	A B C D	29.	A B C D	54.	A B C D	79.	A B C D
5.	A B C D	30.	A B C D	55.	A B C D	80.	A B C D
6.	A B C D	31.	A B C D	56.	A B C D	81.	A B C D
7.	A B C D	32.	A B C D	57.	A B C D	82.	A B C D
8.	A B C D	33.	A B C D	58.	A B C D	83.	A B C D
9.	A B C D	34.	A B C D	59.	A B C D	84.	A B C D
10.	A B C D	35.	A B C D	60.	A B C D	85.	A B C D
11.	A B C D	36.	A B C D	61.	A B C D	86.	A B C D
12.	A B C D	37.	A B C D	62.	A B C D	87.	A B C D
13.	A B C D	38.	A B C D	63.	A B C D	88.	A B C D
14.	A B C D	39.	A B C D	64.	A B C D	89.	A B C D
15.	A B C D	40.	A B C D	65.	A B C D	90.	A B C D
16.	A B C D	41.	A B C D	66.	A B C D	91.	A B C D
17.	A B C D	42.	A B C D	67.	A B C D	92.	A B C D
18.	A B C D	43.	A B C D	68.	A B C D	93.	A B C D
19.	A B C D	44.	A B C D	69.	A B C D	94.	A B C D
20.	A B C D	45.	A B C D	70.	A B C D	95.	A B C D
21.	A B C D	46.	A B C D	71.	A B C D	96.	A B C D
22.	A B C D	47.	A B C D	72.	A B C D	97.	A B C D
23.	A B C D	48.	A B C D	73.	A B C D	98.	A B C D
24.	A B C D	49.	A B C D	74.	A B C D	99.	A B C D
25.	A B C D	50.	A B C D	75.	A B C D	100.	A B C D

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DISCLAIMER NOTE: This course is APPROVED by the Oregon Building Codes Division for continuing education to renew your electrical license and is not intended to replace or supersede any state or local adopted codes.

2021 OREGON ELECTRICAL SPECIALTY CODE

918-008-0085

Statewide Code Interpretation Process

(1) A petitioner may request a statewide code interpretation by providing the following information in writing or on division approved forms:

(a) A brief description of the facts and circumstances giving rise to the need for a statewide code interpretation; and

(b) The specialty code section at issue.

(2) Notwithstanding subsections (1)(a) and (b) of this rule, the division may elect to accept a substantially complete request for a statewide code interpretation if circumstances merit.

(3) After receipt and approval of a petitioner's request for interpretation, the division will process the request, reach a conclusion, and distribute the decision.

(4) Each quarter, the division will communicate to the appropriate advisory board its actions concerning statewide code interpretations.

918-008-0095

Alternate Method Ruling Process

(1) A petitioner may request an alternate method ruling by providing the following information in writing or on division approved forms:

(a) Information on the material, design, or method the person wishes to utilize;

(b) The specialty code section at issue; and

(c) A brief description of the technical and scientific facts and circumstances giving rise to the need for an alternate method ruling.

(2) Notwithstanding subsections (1)(a) through (c) of this rule, the division may elect to accept a substantially complete request for an alternate method ruling if circumstances merit.

(3) After receipt of a petitioner's complete request for interpretation, the appropriate advisory board makes a recommendation on the technical and scientific facts of the proposed alternate method ruling, consistent with ORS 455.060.

(4) After considering the recommendation of the appropriate advisory board, the division makes the final decision on the alternate method ruling and distributes the decision consistent with ORS 455.060.

918-305-0430

Requests for Inspection and Notice of Results

(1) All persons who take out an electrical permit shall request an inspection within 24 hours of:

(a) The completion of any electrical installation intended to be covered or concealed or that is intended to be placed into service before the final electrical inspection; and

(b) The completion of all electrical installations for the job site covered by a particular permit.

(2) Except as provided in Section (3) of this rule, an inspecting jurisdiction shall inspect within 48 hours of a written request for inspection unless the time for inspection is extended to a set date by mutual agreement. The 48 hours excludes Saturdays, Sundays and holidays.

(3) The inspecting jurisdiction shall inspect an installation at a remote location within a reasonable time of the request.

(a) For the purpose of this section, a "remote location" is:

(A) An inspection location that is more than 60 miles one way using the most direct route, measured from the closest of the inspector's station, inspection office or the inspecting jurisdiction's primary offices; or

(B) An inspection location that requires more than one hour of normal driving, one way, using the most direct route from the closest point mentioned in paragraph (A) of this subsection.

(b) For the purposes of this section, "within a reasonable time" means a response time that takes into account the time, distance and number of inspection requests, but shall not exceed seven consecutive calendar days including the date the request was received, unless the time for inspection is extended to a set date by mutual agreement. If the seventh calendar day falls on a weekend or holiday, this is extended to include the next business day.

(4) Reasonable procedures designed to provide actual notice of inspection results shall be used by all inspecting jurisdictions to notify the person requesting inspections, of the results of electrical inspection. "Reasonable procedures designed to provide actual notice" shall include posting at the job site and:

(a) Nothing more, when the installation is by an owner;

(b) Nothing more, when the installation is approved;

(c) Notification of any deficiencies on a specific permit by:

(A) FAX transmittal to the electrical contractor;

(B) Personal delivery to the electrical contractor or signing supervisor;

(C) Mailing; or

(D) Telephone followed by written notification.

(d) By written confirmation of inspection approval if a permit holder requests confirmation.

(5) If the inspection mentioned in Sections (1) and (2) of this rule involves a cover inspection, the work cannot be covered unless:

(a) Inspection clearance is given; or

(b) The request for inspection is in writing communicated to the inspecting jurisdiction, with notice that a cover inspection is involved, no extensions are agreed to and the maximum time for making the required inspection under Sections (1) and (2) of this rule are exceeded. For the purposes of this subsection:

(A) Written request includes a letter, telegram or FAX transmittal; and

(B) The burden of proof is on the person requesting the electrical inspection to prove that a written request was communicated.

918-305-0440

Correction of Defects

(1) Defects in electrical installations noted by the electrical inspector shall be corrected and an inspection request made within 20 calendar days of the date of actual notice of deficiency. For the purpose of this rule, actual notice is given when the inspecting jurisdiction does everything required in OAR 918-271-0020.

(2) If corrections cannot reasonably be made within the specified time in section (1) of this rule, or an interpretation or written appeal has been requested, the permit holder shall contact the inspecting jurisdiction and request an extension of time to a specified date or until deficiency is resolved.

(3) Requests for inspection and requests for extension may be communicated in any way. However, if challenged, the burden of proof is on the requester to document the request was in fact communicated.

Responses may also be communicated in any way, but if challenged, the burden of proof is on the inspecting jurisdiction.

918-305-0470

Appeals

(1) Appeals of decisions recommended by a deputy inspector in relation to the application of the Oregon Electrical Specialty Code shall be to the chief electrical inspector in accordance with OAR 918, division 251, provided that no notice needs to be given to any local jurisdiction.

(2) The chief electrical inspector's determination may be appealed to the director who may consult with the Electrical and Elevator Board or other consultants on any technical issues deemed necessary by the director.

EXAM QUESTIONS

1. **How often does the division issue code interpretations when formally requested?**
   A. Within 10 business days
   B. The second Thursday of every month
   C. Quarterly
   D. Within 15 business days

2. **What ORS does the board use when analyzing technical and scientific facts when making an Alternate Method Ruling?**
   A. 455.060
   B. 918-008-0085
   C. 918-008-0045
   D. 693.020

3. **Oregon requires calling for an electrical inspection within _____ hours of any electrical installation intended to be covered or concealed.**
   A. 24
   B. 48
   C. 36
   D. No requirement.

4. **An inspecting jurisdiction shall inspect within _____ hours of a written request for inspection unless the time for inspection is extended to a set date by mutual agreement.**
   A. 18
   B. 24
   C. 36
   D. 48

5. **Any corrections noted by an electrical inspector are required to be corrected and an inspection request made within _____ calendar days of the date of actual notice of deficiency.**
   A. 10
   B. 15
   C. 20
   D. 30

6. **How many miles from an inspection location using the most direct route measured from the inspector's station is considered a remote location?**
   A. 60 miles
   B. 30 miles
   C. 50 miles
   D. 45 miles

7. All appeals of decisions made by a deputy inspector shall be to the _____.

A. Chief electrical inspector
B. Oregon electrical board
C. The BCD
D. No listed answer

8. True or False? After the chief electrical inspector for Oregon has made a decision on an appeal, no other appeals may be filed.

A. True
B. False

To access and find electrical Board actions, Oregon statute, administrative rule, electrical code, code interpretations, and enforcement case studies go to http://www.cbs.state.or.us/bcd/. On the right side of the page, select the correct board and information desired.

For electricians and contractors to informally request clarification on a code call or interpretation, call your local Authority Having Jurisdiction. To formally request such information, refer to OAR 918-008-0120 listed below:

918-008-0120

State Building Code Appeal Process

(1) A person aggrieved by the building official's decision on the application of the state building code adopted under ORS 447.020, 455.020, 455.610, 460.085, 460.360, 479.730 or 480.545 may appeal to either the local jurisdiction's appeals board or the state specialty code chief. The appeals process selected may not change once initiated.

(2) A filing fee of $20 is required for appeals to the state specialty code chief.

(3) An appeal must be filed within 30 calendar days of the building official's decision.

(4) An appeal must include the following information and other information requested by the chief:

(a) The person filing the appeal, the jurisdiction where the act occurred, and any parties involved, including contact information;

(b) The specific code or codes involved, with proper citation;

(c) A written description of appeal, which may include diagrams or drawings with distances shown to scale;

(d) A copy of any written interpretation or decision, if issued by the jurisdiction;

(e) An explanation why the ruling should be reversed;

(f) The status and date of stop work order if issued; and

(g) Other information as requested by the chief.

(h) Notwithstanding subsection (a) through (g) of this rule, the division may elect to accept a substantially complete request for an appeal when it appears that doing so furthers the interests of the state.

(5) The building official and person appealing must respond within 7 calendar days to a request from the chief for additional information. The chief has 14 days to render a decision and inform both the jurisdiction and the person appealing a decision of a local jurisdiction. The maximum time for rendering a decision may not exceed 30 calendar days. The Building Codes Division Administrator may suspend these procedural time frames when the complexity of the issue merits additional decision time.

(6) A decision by a local jurisdiction's appeals board or chief may be appealed to the appropriate advisory board within 30 calendar days of the decision. A filing fee of $20 is charged for an appeal of a local jurisdiction's appeals board decision.

918-309-0000

Electrical Permits

(1) Except as provided by OAR 918, division 282, dealing with restricted energy transactions, limited maintenance specialty contractor-HVAC/R, and registered telecommunications service provider, the signature of a signing supervising electrician or limited supervising electrician must be required on each permit to aid inspections by the

division and indicate responsibility under ORS 479.710. Any person providing false or incorrect information or false or an incorrect signature to obtain a permit may be subject to compliance action by the board.

(2) The following may purchase electrical permits:

(a) Electrical contractors; and

(b) Registered telecommunications service providers (TSP) as defined in ORS 759.005, including competitive carriers, competitive local exchange carriers (CLEC) and telecommunications utilities. These telecommunications service providers are listed as such by the Public Utilities Commission (PUC).

(3) A permit is required prior to start of electrical work. See OAR 918-309-0080 for temporary permit criteria. Expansion of work under a permit may be added to an existing permit prior to final inspection.

(4) A permit must be posted in a conspicuous place near the main electrical panel location. If there is no main panel installed, the permit must be posted in a conspicuous place on the job site.

(5) An electrical permit, other than a restricted energy electrical permit as provided in OAR 918-309-0400, issued to one person or firm is not transferable and may not permit any other person or firm to perform any electrical work thereunder.

(6) Any permittee holding an unexpired permit may apply for an extension of the time within which work may be completed.

(7) Permits issued by an inspection jurisdiction under the provisions of the Oregon Electrical Specialty Code and these rules expire and become null and void if the work authorized by the permit is:

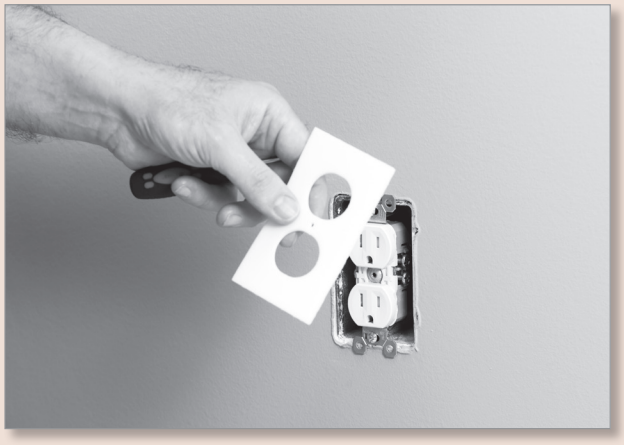
(a) Not started within 180 days from the date of permit issuance; or

(b) Suspended or abandoned for a period of 180 days after the work is started.

(8) Corrections to electrical installations must be completed regardless of 180-day suspension or abandonment of work. All corrections to electrical installations must be completed within 20 calendar days of notice of deficiency. See OAR 918-271-0030 for requirements.

(9) In addition to other signing supervising electricians, the following are authorized to sign permits:

(a) A person whose qualifications are relied upon for licensing under OAR 918-282-0140 is a "supervisor" under ORS 479.560 and can sign for electrical permits or labels for work under a limited maintenance specialty contractor-HVAC/R license;



(b) A Class "A" or Class "B" limited energy technician can sign permits or labels for 100 volt-ampere or less electrical installations performed by those licensees;

(c) A "supervisor" as used in ORS 479.630 who can sign restricted energy permits includes:

(A) A Class "A" or "B" limited energy technician when the electrical installation is within the scope of the person's license;

(B) Persons whose qualifications are relied upon for the issuance of a restricted energy electrical contractor license under OAR 918-282-0060; and

(C) Any other electrical licensee authorized to sign a permit provided the work is within the scope of the person's license.

(10) No electrical permit is required:

(a) To replace light bulbs, fluorescent tubes, or approved fuses, or to connect approved portable electrical equipment to permanently installed and properly wired receptacles;

(b) For experimental electrical work or testing of electrical products in testing laboratories of electric shops, educational institutions, industrial plants, or recognized testing laboratories;

(c) For those minor electrical installations for which the board has authorized an installation label;

(d) To install components exempted by OAR chapter 918, division 261;

(e) To replace an existing garbage disposal, dish washer, electric water heater or similar appliance of 30 amps or less, single phase; or

(f) To install cord and plug connected Class 2 irrigation control systems.

(11) Unless noted otherwise in these rules, a permittee is entitled to two inspections for each electrical installation or portion thereof for which a permit fee is assessed. The total number of inspections under a permit are aggregated and used to inspect any of the installations under the permit. A permittee is considered to have received an inspection only when the permittee has requested and received an inspection from the municipality. Inspections are counted based on a single visit, in person or through an approved electronic inspection method, to a job site. See examples in Table 2-E.

918-309-0010

Electrical Permit Form and Format

The division has adopted a:

(1) Standardized statewide electrical permit application format; and

(2) Uniform statewide method for calculating permit fees:

(a) Fees can only be charged for the categories and under the procedures and requirements established in OAR chapter 918, division 309.

(b) The fees set out in OAR 918-309-0070 are for state permits. Local jurisdictions may set different fees as authorized by ORS 479.845.

(c) The fees established for the various categories adopted in this rule shall be inserted in the permit application form for local jurisdictions.

(d) The surcharge required by ORS 455.210 and 455.220 shall be added to the fees established.

EXAM QUESTIONS

9. What side of the Oregon Build Codes division website is the link to find electrical Board actions, Oregon statute, administrative rule, electrical code, code interpretations, and enforcement case studies?

A. Left
B. Right
C. Top
D. Bottom

10. A code appeal process can be initiated to either the local jurisdiction's appeals board or the state _____.

A. Specialty code chief
B. Electrical Board
C. Electrical committee
D. BCD

11. How long does a person initiating the code appeal process have to respond when the chief electrical inspector asks for more information?

A. 7 calendar days
B. 14 days
C. 30 calendar days
D. 14 business days

12. How much money does it cost to file a state building code appeal?

A. 50 dollars
B. 20 dollars
C. 12 dollars
D. No fee required

13. What Oregon Administrative Rule would you reference to determine if you needed an electrical permit?

A. 918-309-0000
B. 918-305-0430
C. 918-305-0440
D. 918-282-0170

14. What permit is required to install cord and plug connected Class 2 irrigation control systems?

A. Phased permit
B. Class A
C. Class B
D. No permit required

15. Oregon has created a Standardized _____ electrical permit application format.

A. National
B. City
C. Statewide
D. County

16. Oregon has created a _____ statewide method for calculating permit fees.

A. Division based
B. Agency based
C. Area based
D. Uniform

17. Fees can only be charged for the categories established in OAR chapter 918, division _____.

A. 420
B. 512
C. 309
D. 318

18. If there is no main panel installed on a jobsite yet, where is the electrical permit required to be posted?

A. In a conspicuous place on the job site
B. In the truck window
C. In the break area
D. In the parts crib

19. What is the maximum amperage garbage disposal you can install without an electrical permit?

A. 15 amp
B. 25 amp
C. 20 amp
D. 30 amp

20. A surcharge required by ORS _____ and 455.220 shall be added to the fees established.

A. 455.110
B. 455.320
C. 455.210
D. 455.420

918-282-0170

General Journeyman License

(1) A general journeyman:

(a) Is authorized to make any electrical installation; and

(b) Shall work under the supervision, direction and control of a general supervising electrician unless doing the type of work that may be supervised, directed or controlled by a person holding a specific limited supervising electrician license, or the type of work requiring no supervision.

(2) A general journeyman working in a manufacturing or industrial plant without a supervising electrician or engineer is limited to maintenance work.

(3) License and Equivalent Requirements.

(a) Applicants for acceptance under equivalent requirements shall show proof of the following work categories and minimum hours of on-the-job training or experience:

(A) Stock room and material handling, 100 hours:

(i) Shop;

(ii) Service.

(B) Residential Wiring, 1,000 hours:

(i) Service and panel;

(ii) Conduit, flex, romex boxes, electric heating systems;

(iii) Wire pulling and taps;

(iv) Wiring devices and fixtures;

(v) Remodel and finish work.

(C) Commercial Installations, 1,000 hours:

(i) Services, switchboards and panels;

(ii) Conduit, flex, metal moldings, floor duct and boxes;

(iii) Wire pulling and taps;

(iv) Wire devices;

(v) Lighting fixtures - high voltages, explosion proof, perimeter lighting.

(D) Industrial Installations, 1,000 hours:

(i) Services, switchboards and panels;

(ii) Conduit, tray and boxes;

(iii) Wire pulling and taps;

(iv) Motor and equipment installations;

(v) Lighting fixtures - High voltage, explosion proof, security lighting.

(E) Intercommunication, Signal and Control Systems, 500 hours;

(F) Underground Construction, 100 hours:

(i) Tunnel rack work;

(ii) Ditch digging and material handling;

(iii) Conduit preparation.

(G) Trouble Shooting and Maintenance, 250 hours;

(H) Finishing and Fixture Hanging, 50 hours;

(I) Total Minimum Subject Hours, 4,000.

(b) Total Hours Required. Total electrical work experience shall be at least 8,000 hours. No more than 300 percent credit shall be allowed for subjects (A) through (H) for any one subject;

(c) Related Training Classes. Applicants shall submit transcripts with passing grades of "C" or better in graded classes and a "pass" in non-graded classes in the following related electrical training classes:

(A) Electrical mathematics;

(B) Safety and accident prevention;

(C) Care and use of hand and power tools;

(D) Blueprint reading and electrical symbols;

(E) Introduction to National Electrical Code;

(F) Electrical fundamentals and basic theory, including AC and DC;

(G) Electrical measuring devices;
(H) Wiring methods; PIC 10
(I) Low voltage and limited energy circuits;
(J) Residential, industrial and commercial calculations;
(K) Motors, generators and transformers;
(L) Practical circuit sketching;
(M) Lighting circuits;
(N) Fundamentals of electronics;
(O) High voltage distribution and equipment

918-309-0025 Phased Permitting

(1) During the plan review process, an electrical contractor may request a complete or partial permit before the entire plans and specifications are submitted or approved, if adequate information is provided showing compliance with pertinent portions of the code. The permittee proceeds at his or her own risk, without assurance that the permit for the entire installation will be granted, or that corrections will not be required, including those portions permitted. The partial permit shall allow the electrical contractor to proceed with work pertaining to the electrical system of the structure.

(2) Any inspections performed by the local jurisdiction on the site or of the ground work shall be counted toward the number of electrical inspections allowed by the full permit once plan review is complete and the permit is issued.

EXAM QUESTIONS

21. How many hours does a general Journeyman need in industrial work to qualify for the Oregon State General journeyman exam?

A. 250
B. 500
C. 1000
D. No such requirement.

22. The state of Oregon will accept a non-graded pass score as proof of training hours for what area of study listed below?

A. Shop
B. Tunnel rack work
C. Conduit preparation
D. Electrical measuring devices

23. During the plan review process, an electrical contractor may request a complete or partial _____before the entire plans and specifications are submitted.

A. Extension
B. Payment
C. Revision
D. Permit

24. How many hours does a general journeyman need in trouble shooting and maintenance to qualify for the Oregon State general journeyman exam?

A. 250 hours
B. 50 hours
C. 100 hours
D. 500 hours

90.4 Enforcement. 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 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 Oregon Structural Specailty 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.

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.

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-one 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.

110.10 Circuit Impedance; Short-Circuit Current 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.

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 Marking.

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.

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 panic hardware or 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 sections are not part of this code but are provided here for the reader's convenience.

OSSC Section 1010.10.10.1 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 not less than one-half of the door leaf width.
4. The maximum unlatching force shall not exceed 15 pounds (67 N). OSSC Section 1010.1.10.2

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.

EXAM QUESTIONS

25. What does "listed" or "labeled" mean under ORS 479.530?

A. Catalog number
B. Certified electrical product
C. Tested product
D. stamped and legible

26. How do requests for special permission need to be made to the authority having jurisdiction?

A. In writing
B. Certified mail
C. Orally
D. All listed answers

27. What is 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?

A. Motel space
B. Hotel room
C. Dormitory
D. Confinement area

28. What best defines 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?

A. Fire suppression system
B. Fire protection system
C. Initiation devices
D. Annunciating devices

29. What is the term reconditioned frequently referred to as?

A. rebuilt
B. remanufactured
C. refurbished
D. All listed answers

30. What fault-current values can be used to satisfy the labeling requirements of 110.10?

A. Instantaneous short circuit condition of the Main
B. FLA of the service
C. Serving utility
D. The calculated current between any 2 phases

31. True or False? A permit holder in Oregon is required to demonstrate compliance with all tightening torque requirements upon request.

A. True
B. False

32. Who can allow the marking requirements of 110.24 (A) to be ignored?

A. The supervising electrician
B. The job foreman
C. Any licensed electrician
D. The construction management entity

33. What direction is an egress door equipped with fire exit hardware required to open towards?

A. The direction of the equipment
B. The direction of egress
C. The direction of the control room
D. All listed answers

34. What is the maximum allowable unlatching force permitted for an egress door?

A. 5 pounds
B. 15 pounds
C. 10 pounds
D. 20 pounds

35. What UL number is panic hardware installed on an egress door in Oregon required to be listed in accordance with?

A. 305
B. 350
C. 315
D. 395

36. If balanced doors are used and panic hardware is required, the panic hardware is required to be of what type?

A. Sensor driven
B. The push-pull type
C. Automatic initiated
D. The push-pad type

(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 panic hardware or fire exit hardware.

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 panic hardware or 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 (E) and (G). The ground-fault circuit-interrupter shall be installed in a readily accessible location. For the purposes 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.

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

(A)(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."

Informational Note: See 760.41(B) and 760.121(B) for power supply requirements for fire alarm systems. Receptacles installed under the exception to 210.8(A)(5) shall not be considered as meeting the requirements of 210.52(G).

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).

(B) Other than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles 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 wet locations

(B)(8) Garages, service bays, and similar areas other than vehicle exhibition halls and showrooms

(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 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."

(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.

(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.

210.8 (G) Mobile Concession Stands. All 125-volt through 250-volt receptacles supplied by single-phase branch circuits rated 150-volts or less to ground, 50 amperes or less, intended to supply a mobile food cart or concession stand shall have ground-fault circuit-interrupter protection for personnel.

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.

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).

(D) Branch Circuit Extensions or Modifications – Dwelling Units, and Dormitory Units. Where branch circuit wiring for any of the areas specified in 210.12(A), or (B) 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)(1) 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.

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

EXAM QUESTIONS

37. What is the minimum required illumination when measured at the floor for all working spaces about service equipment?

A. 10 foot candles average
B. 15 foot candles average
C. 20 foot candles average
D. 30 foot candles average

38. Where are ground-fault circuit-interrupters required to be installed?

A. 24" above finish grade
B. Accessible location
C. Protected location
D. Readily accessible location

39. What section should be referenced for the power supplies that power fire alarm systems?

A. 730.41(B) and 750.121(B)
B. 740.41(B) and 770.121(B)
C. 760.41(B) and 760.121(B)
D. 760.41(C) and 760.121(D)

40. True or False? GFCI protection is required for all branch circuits that power dishwashers in Oregon.

A. True
B. False

41. How many conditions must be met where GFCI protection is not be required for a single receptacle serving an appliance or a duplex receptacle serving two appliances?

A. 3
B. 2
C. 1
D. 4

42. What type of protection is required for lighting outlets not exceeding 120 volts installed in crawl spaces at or below grade level?

A. AFCI
B. GFCI
C. Fast acting
D. Inverse time circuit breaker

43. What type of protection are receptacles that supply mobile concession stands required to have?

A. Intermittent duty
B. AFCI
C. GFCI
D. No protection required

44. 15- and 20-ampere branch circuits supplying outlets in alcoves shall be protected by any of the means as described in what section(s)?

A. 210.12(A)(1) through (6)
B. 220.12(A)(1) through (4)
C. 215.12(B)(1) through (8)
D. 210.2(A)(1) through (6)

45. What type of raceway is a fire alarm branch circuit required to be installed in?

A. Sealed
B. Plastic
C. Metal
D. Concealed

46. The extensions or modifications of existing circuits in a dormitory require what type of breaker to be installed?

A. Inverse time circuit breaker
B. AFCI
C. GFCI
D. No requirement to change the existing breaker(s)

47. A service upgrade in a dormitory unit requires what type of breaker(s) to be installed?

A. Inverse time circuit breaker
B. AFCI
C. GFCI
D. No requirement to change the existing breaker(s)

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

210.52 (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.

(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 (6½ 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.

(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.

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.

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.

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.

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.

230.70 (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.

230.71 Maximum Number of Disconnects. (A) General. The service disconnecting means for each service permitted by 230.2, or for each set of service-entrance conductors 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. For the purpose of this section, disconnecting means installed as part of listed equipment and used solely for the following shall not be considered a service disconnecting means:

(1) Power monitoring equipment

(2) Surge-protective device(s)

(3) Control circuit of the ground-fault protection system

(4) Power-operable service disconnecting means

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 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.

EXAM QUESTIONS

48. How many receptacles are required to be installed where an island countertop has a long dimension of 30 inches?

A. 1
B. 2
C. 3
D. No requirement

49. In general, a single receptacle outlet is required to be installed in bathrooms within _____ of the outside edge of each basin.

A. 2 ft
B. 3 ft
C. 18 inches
D. 42 inches

50. What is the maximum height above a deck walking surface that a receptacle can be installed?

A. 3ft
B. 6 ft
C. 4 ft
D. 6½ ft

51. When replacing existing HVAC equipment, a receptacle outlet is not required if one is already located on the same level and within how many feet?

A. 50 feet
B. 65 feet
C. 75 feet
D. 25 feet

52. What is the disconnecting means specified in Article 225.31 required to be comprised of?

A. A circuit breaker
B. General use switch
C. Molded case switch
D. All listed answers

53. What is required to use a certified in-line fuse holder for a single light pole installation?

A. Be installed by a qualified person
B. Get special permission
C. Be installed in an accessible location
D. All listed answers

54. A one-family dwelling unit and its accessory structures are permitted to have one set of service-entrance conductors run to each from a single service drop, and when there are continuous metallic paths bonded to the grounding system in the buildings involved, what is required to be installed to meet the provisions of Article 225, 230, and 250?

A. A disconnect
B. A grounded conductor
C. An equipment grounding conductor
D. All listed answers

55. According to OESC 230.43, what are Items (13) and (15) are limited to?

A. Traffic control devices and highway lighting poles
B. Instrumentation and process control
C. Transformers
D. Panelboards

56. How many conditions must be met to use the exception to 230.70 (A)(1)?

A. 2
B. 1
C. 3
D. 4

57. There shall be not more than _____ of disconnects per service grouped in any one location.

A. Two sets
B. Four sets
C. Eight sets
D. Six sets

58. When is the ground-fault protection system performance test required to be done?

A. At the service inspection
B. When first installed on site
C. After the service has been energized
D. During the fire marshal inspection

240.67 (C) Performance Testing. The arc energy reduction protection system shall be performance tested when first installed on site. The testing shall be conducted by a 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.

240.87 (C) Performance Testing. The arc energy reduction protection system shall be performance tested when first installed on site. The testing shall be conducted by a 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 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 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.

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). 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 structure 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. 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 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).

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

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 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. If an IBT is used it shall comply with the following:

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.

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.

300.9 Raceways in Wet Locations Above grade. 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 abovegrade 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.

EXAM QUESTIONS

59. When is the arc energy reduction protection system performance test required to be done?

A. During the fire marshal inspection
B. At the service inspection
C. After the service has been energized
D. When first installed on site

60. Who is required to sign the arc energy reduction protection system performance test?

A. The construction management company
B. The AHJ
C. The person(s) performing the test
D. The occupancy forbearer

61. Where would you find the definition for Underground?

A. Article 100
B. Article 220
C. Article 327
D. Article 450

62. If multiple concrete-encased electrodes are present at a building or structure, how many of the different electrodes are you required to bond into the grounding electrode system?

A. 1
B. 2
C. All electrodes
D. The electrode with the shortest patch to the service disconnect

63. What is the minimum length required for a concrete-encased electrode?

A. 18 ft
B. 6 ft
C. 10 ft
D. 20 ft

64. What article requires an existing metal underground water pipe to be bonded to a new grounding electrode system?

A. 250.66
B. 250.122
C. 250.104(A)
D. 250.52(A)

65. What resistance to earth must a grounding electrode measure where no supplemental electrode would be required?

A. 25 ohms or less
B. 30 ohms or less
C. 50 ohms or less
D. 30 ohms to 50 ohms

66. What size conductor is required to be installed for intersystem bonding termination devices?

A. 2 AWG
B. 6 AWG
C. 4 AWG
D. 1/0

67. What does Oregon require to be installed in a metallic conduit installed on a rooftop?

A. Pull string
B. Strain relief
C. An equipment grounding conductor
D. All listed answers

68. What does the OESC require to be done with spare or unused raceways?

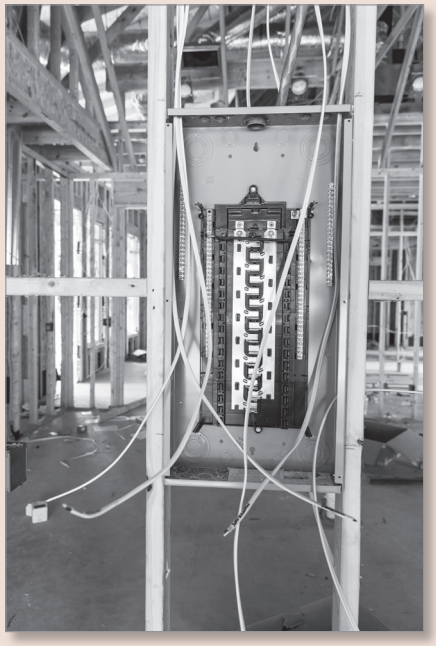
A. Be Labeled on both ends
B. Be sealed or plugged
C. Pull strings installed
D. All listed answers

69. What article are insulated conductors and cables installed in raceways above grade in wet locations required to comply with?

A. 310.10(C)
B. 310.15(b)
C. 300
D. 250.122

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, 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. 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 listed for the sole support of ceiling-suspended (paddle) fans.



320.30 (A) General. Type AC cable shall be supported and secured by staples; cable ties, 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, 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. 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-inch drywall, or other approved means.

(C) In Unfinished Basements. Where cable is run at angles with joists in unfinished basements, 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.

334.30 Securing and Supporting. Nonmetallic-sheathed cable shall be supported and secured by staples; cable ties 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.

336.10 Uses Permitted. Type TC cable shall be permitted to be used as follows: (9) 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, 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 secured at intervals not to exceed 1.4 m (41⁄2 ft).

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 (41⁄2 ft).

EXAM QUESTIONS

70. How far from a termination point containing MV cable does the cable need to be supported?

A. 2 ft
B. 5 ft
C. 6 ft
D. 3 ft

71. How do boxes that contain ceiling-suspended (paddle) fans need to be listed?

A. As a junction box
B. For 35 lbs
C. As a splice point
D. For the sole support of ceiling-suspended paddle fans

72. What is an approved method of securing and supporting Type AC cable?

A. Hangers
B. Cable ties
C. Staples
D. All listed answers

73. What is an approved method of securing and supporting Type MC cable?

A. Hangers
B. Cable ties
C. Staples
D. All listed answers

74. What article does NM cable need to comply with if installed above a residential suspended ceiling cavity?

A. 300.4(F)
B. 334.15
C. 310.10(C)
D. 310.15(b)

75. What distance above finished floor can surface mount NM cable be run without physical protection?

A. 5 feet
B. 6 foot 7 inches
C. 7 feet
D. 8 feet

76. How far from a junction box does nonmetallic-sheathed cable need to be secured?

A. 6 inches
B. 18 inches
C. 24 inches
D. 12 inches

77. What part of Article 334 are the installation requirements for type TC-ER-JP cable used as interior wiring required to comply with?

A. Part III
B. Part I
C. Part II
D. Part IV

78. How far from a box does FMC need to be secured?

A. 12 inches
B. 18 inches
C. 24 inches
D. 36 inches

79. How far from a conduit body does LFMC need to be secured?

A. 12 inches
B. 18 inches
C. 24 inches
D. 36 inches

356.30 Securing and Supporting. (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.

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.

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) as applicable:

393.14 (A) General Requirements. Support wiring 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 is not 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.

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, 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.

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

400.12 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).

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

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), (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 suites of hotels, motels, and their common areas

(3) Child care facilities

(4) Preschools and elementary education facilities

(7) Dormitories

EXAM QUESTIONS

80. How far from a device box does ENT need to be supported?

A. 12 inches
B. 18 inches
C. 24 inches
D. 36 inches

81. All knob-and-tube circuits are required to have overcurrent protection in compliance with what column of Table 310.15(B)16 of the NFPA 70-2017?

A. 60° C
B. 90° C
C. 75° C
D. There are no special requirements

82. Who must approve flexible cords and flexible cables used at airports that are part of listed assemblies for fixtures and controllers?

A. Authority Having Jurisdiction
B. Federal Aviation Administration
C. Oregon BCD
D. All listed answers

83. What is the maximum length cord permitted where flexible power-supply cords that are part of a listed assembly, other than a luminaire, can be installed above suspended or dropped ceilings?

A. 3 feet
B. 5 feet
C. 6 feet
D. 10 feet

84. Where does Oregon a require a tamper-resistant receptacle to be installed?

A. Dwelling units
B. Child care facilities
C. Dormitories
D. All listed answers

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, 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.

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 protected 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.

Exception No. 2: Individual protection shall not be required for a panelboard protected on its supply side by two main circuit breakers or two sets of fuses 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 residential occupancy.

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 and 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."

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.

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

EXAM QUESTIONS

85. If equipment has been damaged by fire or water and needs to be reconditioned, who can evaluate the equipment and return it to service?

A. The signing supervisor
B. A qualified testing laboratory
C. The equipment manufacturer
D. All listed answers

86. Individual protection is not required for a panelboard used as service equipment with multiple disconnecting means if installed in accordance with what section?

A. 408.8(B)
B. 408.8(A)
C. 230.71
D. 422.5(A)(1)

87. What appliance(s) cannot use a factory installed unit switch to disconnect all ungrounded conductors as described in OESC 422.34?

A. Ovens
B. Dishwashers
C. Ranges
D. All listed answers

88. What direction is an egress door designated as a battery room equipped with fire exit hardware required to open towards?

A. The direction of the equipment
B. The direction of egress
C. The direction of the control room
D. All listed answers

89. What are you required to do with the existing labels on reconditioned switchgear?

A. Update the labels
B. Recondition the labels
C. Remove the labels
D. Update the serial number label only

500.8 Equipment. (A) Suitability. "Suitability of identified equipment" as used in 500.8 (A) means that equipment meets the requirements of ORS 479.760.

517.10 (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.

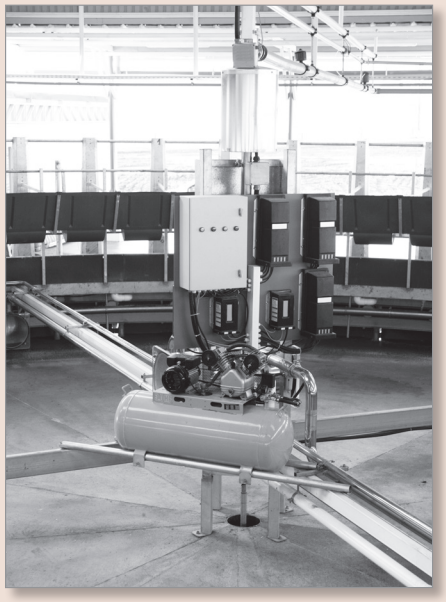
(2) Areas of nursing homes and limited care facilities wired in accordance with Chapters 1 through 4 of this Code where these areas are used exclusively as patient sleeping rooms.

(3) 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. 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).

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



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, equipotential planes shall comply with 547.10(A)(1) and (A)(2).

(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 in Article 100.

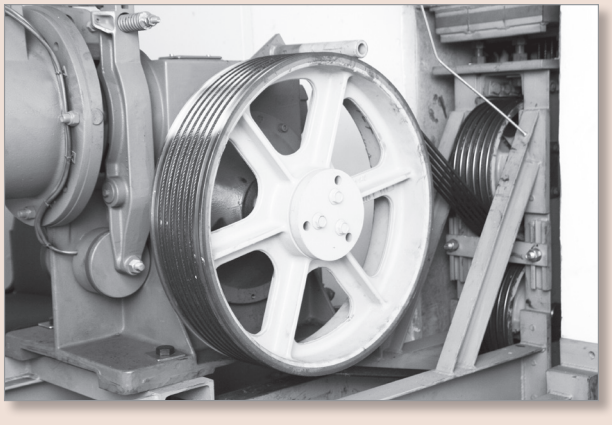
555.35 (A)(3) Feeder and Branch-Circuit Conductors with GFPE.

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 properly installed and maintained with no evidence of impending failure.

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 300.4.



620.1 Scope. Informational Note No. 1: For further information, see the Oregon Elevator Specialty Code as adopted in OAR chapter 918, division 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 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).

620.6 Ground-Fault Circuit-Interrupter Protection for Personnel. A single receptacle supplying a permanently installed sump pump shall not require ground-fault circuit-interrupter protection.

620.51 (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.

EXAM QUESTIONS

90. What type of office does 517.10 (B) not cover?

A. Intramuscular injections office
B. Optometry office
C. Audiology office
D. All listed answers

91. What type of occupancy can PVC conduit be installed underground in concrete for dental clinics?

A. Private occupancies
B. Type A occupancies
C. Type C occupancies
D. Type B occupancies

92. When equipment ground-fault protection is first installed, what level(s) are required to be performance tested to ensure compliance with 517.17(C)?

A. The final level
B. The first level
C. Each level
D. Any level

93. Within what distance does a GFCI protected receptacle need to be installed from a single receptacle supplying a dedicated load and marked "not GFCI protected" in an agricultural building?

A. 2 ft
B. 3 ft
C. 5 ft
D. 6 ft

94. What ORS defines a professional engineer?

A. ORS 627.002(2)
B. ORS 672.002(3)
C. ORS 672.002(2)
D. ORS 672.020(2)

95. What exception applies to the supply terminals of the equipment supplied by the transformer secondary conductors as applied to 555.35(A)(3)?

A. Exception No. 1 to (3)
B. Exception No. 2 to (3)
C. Exception No. 1 to (8)
D. Exception No. 3 to (1)

96. What can there be no evidence of when overcurrent protective devices that have been previously used are installed in a temporary installation?

A. Fracture
B. Impending failure
C. Corrosion
D. All listed answers

97. How often are the cables listed in 600.33(B)(1) required to be supported?

A. 2 ft
B. 6 ft
C. 5 ft
D. 3 ft

98. What division of OAR chapter 918 adopts the Oregon Elevator Specialty Code?

A. 350
B. 918
C. 200
D. 400

99. What best defines a circuit dedicated solely for the purpose intended without other devices, systems or equipment connected to the circuit?

A. Individual branch circuit
B. Dedicated branch circuit
C. Identified branch circuit
D. Separate branch circuit

100. How close to a platform lift is the disconnecting means required to be located from the motor controller?

A. 5 ft
B. 2 ft
C. 6 ft
D. 3 ft