

2023 Seattle Electrical Code (Proposed Amendments)

W or S	Article Number	Section Title	Current 2020 SEC language	Proposed Seattle changes (2023 NEC base language overlaid with proposed 2023 Seattle changes or 2023 Washington State changes)	Why do you want to make this change?
Article 300 Wiring Methods and Materials					
N	300.1	Scope	<p>300.1 Scope.</p> <p>(A) All Wiring Installations. This article covers general requirements for wiring methods and materials for all wiring installations unless modified by other articles in Chapter 3.</p> <p><u>Wiring methods in educational or institutional facilities as defined in this chapter must be metallic or nonmetallic raceways, MI, MC, or AC cable. Places of assembly located within these facilities must comply with NEC 518.4(A).</u></p> <p><u>Exception: Assisted living facility generator systems may be wired and installed in accordance with Article 517, Health Care Facilities, of this Code.</u></p> <p><u>Informational Note: WAC 296-46B-010(13), requirement for wiring method for assisted living facility generators, is incorporated herein with edits as an Exception.</u></p> <p>(B) Integral Parts of Equipment. The provisions of this article are not intended to apply to the conductors that form an integral part of equipment, such as motors, controllers, motor control centers, or factory-assembled control equipment or listed utilization equipment.</p> <p>(C) Metric Designators and Trade Sizes. Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be as designated in Table 300.1(C).</p>	<p>300.1 Scope.</p> <p>(A) All Wiring Installations. This article covers general requirements for wiring methods and materials for all wiring installations unless modified by other articles in Chapter 3.</p> <p><u>Wiring methods in educational or institutional facilities as defined in this chapter must be metallic or nonmetallic raceways, MI, MC, or AC cable. Places of assembly located within these facilities must comply with NEC 518.4(A).</u></p> <p><u>Exception: Assisted living facility generator systems may be wired and installed in accordance with Article 517, Health Care Facilities, of this Code.</u></p> <p><u>Informational Note: WAC 296-46B-010(13), requirement for wiring method for assisted living facility generators, is incorporated herein with edits as an Exception.</u></p> <p>(B) Integral Parts of Equipment. The requirements of this article are not intended to apply to the conductors that form an integral part of equipment, such as motors, controllers, motor control centers, or factory-assembled control equipment or listed utilization equipment.</p> <p>(C) Metric Designators and Trade Sizes. Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be as designated in Table 300.1(C).</p>	<p>NEC changes “provisions” to “requirements. No other changes.</p> <p>Keep 2020 amendments, overlay on new 2023 NEC language.</p>
N	300.4	Protection Against Physical Damage	<p>300.4 Protection Against Physical Damage. Where subject to physical damage, conductors, raceways, and cables shall be protected.</p> <p>(A) Cables and Raceways Through Wood Members.</p> <p>(1) Bored Holes. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed through bored holes in joists, rafters, or wood members, holes shall be bored so that the edge of the hole is not less than 32 mm (1 1/4 in.) from the nearest edge of the wood member. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by screws or nails by a steel plate(s) or bushing(s), at least 1.6 mm (1/16 in.) thick, and of appropriate length and width installed to cover the area of the wiring. <u>Where installed in exterior walls, all wiring and device boxes must be a minimum of 63 mm (2 1/2 in.) from the exterior wall surface of the framing member.</u></p> <p><i>Exception No. 1: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical</i></p>	<p>300.4 Protection Against Physical Damage. Where subject to physical damage, conductors, raceways, and cables shall be protected.</p> <p>(A) Cables and Raceways Through Wood Members.</p> <p>(1) Bored Holes. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed through bored holes in joists, rafters, or wood members, holes shall be bored so that the edge of the hole is not less than 32 mm (1 1/4 in.) from the <u>edges</u> of the wood member. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by screws or nails by a steel plate(s) or bushing(s), at least 1.6 mm (1/16 in.) thick, and of appropriate length and width installed to cover the area of the wiring. <u>Where installed in exterior walls, all wiring and device boxes must be a minimum of 63 mm (2 1/2 in.) from the exterior wall surface of the framing member.</u></p> <p><i>Exception No. 1: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid PVC conduit, RTRC, or electrical metallic tubing.</i></p> <p><i>Exception No. 2: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick</i></p>	<p>NEC changes minimal, mostly clarifying language. New exception to 38mm spacing for (E) Cables, raceways and boxes installed in or under corrugated metal roof decking.</p> <p><u>...Exception No. 2: The 38 mm (1 1/2 in.) spacing is not required where metal-corrugated sheet roof decking is covered with a minimum thickness 50 mm (2 in.) concrete slab, measured from the top of the corrugated roofing.</u></p> <p>No Seattle changes</p> <p>Keep 2020 amendments, overlay on new 2023 NEC language.</p>

metallic tubing.

Exception No. 2: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

Exception No. 3: The installation of all structural elements and mechanical systems (e.g., framing, plumbing, ducting, etc.) must be complete in the area(s) where electrical inspection is requested. Prior to completion of an exterior wall cover inspection, either: (a) The exterior shear panel or sheathing nail inspection must be completed by the building inspector; or (b) All wiring and device boxes must be a minimum of 63 mm (2 1/2 in.) from the exterior surface of the framing member; or (c) All wiring and device boxes must be protected by a steel plate a minimum of 1.6 mm (1/16 in.) thick of appropriate width and height installed to cover the area of the wiring or box.

Informational Note: WAC 296-46B-010(6), requirements for protecting wiring in walls, are incorporated herein as Exception 3.

- (2) **Notches in Wood.** Where there is no objection because of weakening the building structure, in both exposed and concealed locations, cables or raceways shall be permitted to be laid in notches in wood studs, joists, rafters, or other wood members where the cable or raceway at those points is protected against nails or screws by a steel plate at least 1.6 mm (1/16 in.) thick, and of appropriate length and width, installed to cover the area of the wiring. The steel plate shall be installed before the building finish is applied.

Exception No. 1: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

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(B) Nonmetallic-Sheathed Cables and Electrical Nonmetallic Tubing Through Metal Framing Members.

(1) Nonmetallic-Sheathed Cable.

(a) In both exposed and concealed locations where nonmetallic-sheathed cables, operating at less than 120 volts nominal, pass through either factory- or field-punched, cut, or drilled slots or holes in metal members, the cable shall be protected by listed bushings or listed grommets covering all metal edges that are securely fastened in the opening prior to installation of the cable.

(b) Where nonmetallic-sheathed cables operate at 120 volts nominal or greater pass through either factory- or field-punched, cut, or drilled slots or holes in metal members, listed two-piece interlocking bushings or grommets shall be installed prior to passing the cable through such openings.

- (2) **Nonmetallic-Sheathed Cable and Electrical Nonmetallic Tubing.** Where nails or screws are likely to penetrate nonmetallic-sheathed cable or electrical nonmetallic tubing, a steel sleeve, steel plate, or steel clip not less than 1.6 mm (1/16 in.) in thickness shall be used to protect the cable or tubing.

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Exception No. 1: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

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(b) Where nonmetallic-sheathed cables operate at 120 volts nominal or greater pass through either factory- or field-punched, cut, or drilled slots or holes in metal members, listed two-piece interlocking bushings or grommets shall be installed prior to passing the cable through such openings.

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Exception: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

- (C) Cables Through Spaces Behind Panels Designed to Allow Access.** Cables or raceway-type wiring methods, installed behind panels designed to allow access shall be supported according to their applicable articles.

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(D) Cables and Raceways Parallel to Framing Members and Furring Strips. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed parallel to framing members, such as joists, rafters, or studs, or is installed parallel to furring strips, the cable or raceway shall be installed and supported so that the nearest outside surface of the cable or raceway is not less than 32 mm (1 1/4 in.) from the nearest edge of the framing member or furring strips where nails or screws are likely to penetrate. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by nails or screws by a steel plate, sleeve, or equivalent at least 1.6 mm (1/16 in.) thick.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

Exception No. 2: For concealed work in finished buildings, or finished panels for prefabricated buildings where such supporting is impracticable, it shall be permissible to fish the cables between access points.

Exception No. 3: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(E) Cables, Raceways, or Boxes Installed in or Under Roof Decking. A cable, raceway, or box, installed in exposed or concealed locations under metal-corrugated sheet roof decking, shall be installed and supported so there is not less than 38 mm (1 1/2 in.) measured from the lowest surface of the roof decking to the top of the cable, raceway, or box. A cable, raceway, or box shall not be installed in concealed locations in metal-corrugated, sheet decking-type roof.

Informational Note: Roof decking material is often repaired or replaced after the initial raceway or cabling and roofing installation and may be penetrated by the screws or other mechanical devices designed to provide "hold down" strength of the waterproof membrane or roof insulating material.

Exception: Rigid metal conduit and intermediate metal conduit shall not be required to comply with 300.4(E).

(F) Cables and Raceways Installed in Shallow Grooves. Cable- or raceway-type wiring methods installed in a groove, to be covered by wallboard, siding, paneling, carpeting, or similar finish, shall be protected by 1.6 mm (1/16 in.) thick steel plate, sleeve, or equivalent or by not less than 32-mm (1 1/4-in.) free space for the full length of the groove in which the cable or raceway is installed.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

Exception No. 2: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(G) Fittings. Where raceways contain 4 AWG or larger insulated circuit conductors, and these conductors enter a cabinet, a box, an enclosure, or a

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Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

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Exception No. 3: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(E) Cables, Raceways, or Boxes Installed in or Under Metal-Corrugated Roof Decking. A cable, raceway, or box, installed in exposed or concealed locations under metal-corrugated sheet roof decking, shall be installed and supported so there is not less than 38 mm (1 1/2 in.) measured from the lowest surface of the roof decking to the top of the cable, raceway, or box. A cable, raceway, or box shall not be installed in concealed locations in metal-corrugated, sheet decking-type roof.

Informational Note: Roof decking material is often repaired or replaced after the initial raceway or cabling and roofing installation and may be penetrated by the screws or other mechanical devices designed to provide "hold down" strength of the waterproof membrane or roof insulating material.

Exception No. 1: Rigid metal conduit and intermediate metal conduit, with listed steel or malleable iron fittings and boxes, shall not be required to comply with 300.4(E).

Exception No. 2: The 38 mm (1 1/2 in.) spacing is not required where metal-corrugated sheet roof decking is covered with a minimum thickness 50 mm (2 in.) concrete slab, measured from the top of the corrugated roofing.

(F) Cables and Raceways Installed in Shallow Grooves. Cable- or raceway-type wiring methods installed in a groove, to be covered by wallboard, siding, paneling, carpeting, or similar finish, shall be protected by 1.6 mm (1/16 in.) thick steel plate, sleeve, or equivalent or by not less than 32-mm (1 1/4-in.) free space for the full length of the groove in which the cable or raceway is installed.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid PVC conduit, RTRC or electrical metallic tubing.

Exception No. 2: A listed and marked steel plate less than 1.6 mm (1/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(G) Fittings. Where raceways contain 4 AWG or larger insulated circuit conductors, and these conductors enter a cabinet, a box, an enclosure, or a raceway, prior to the installation of conductors, the conductors shall be protected in accordance with any of the following:

- (1) An identified fitting providing a smoothly rounded insulating surface

			<p>raceway, the conductors shall be protected in accordance with any of the following:</p> <ol style="list-style-type: none"> (1) An identified fitting providing a smoothly rounded insulating surface (2) A listed metal fitting that has smoothly rounded edges (3) Separation from the fitting or raceway using an identified insulating material that is securely fastened in place (4) Threaded hubs or bosses that are an integral part of a cabinet, box, enclosure, or raceway providing a smoothly rounded or flared entry for conductors <p>Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed conductors</p> <p>(H) Structural Joints. A listed expansion/deflection fitting or other approved means shall be used where a raceway crosses a structural joint intended for expansion, contraction or deflection, used in buildings, bridges, parking garages, or other structures.</p>	<ol style="list-style-type: none"> (2) A listed metal fitting that has smoothly rounded edges (3) Separation from the fitting or raceway using an identified insulating material that is securely fastened in place (4) Threaded hubs or bosses that are an integral part of a cabinet, box, enclosure, or raceway providing a smoothly rounded or flared entry for conductors <p>Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed conductors.</p> <p>(H) Structural Joints. A listed expansion/deflection fitting or other approved means shall be used where a raceway crosses a structural joint intended for expansion, contraction or deflection, used in buildings, bridges, parking garages, or other structures.</p>	
S	Table 300.5(A), Note 6	Underground installations	No amendments in 2020 SEC. [S] adopted SEC language.	<p>300.5 Underground Installations.</p> <p>(A) Minimum Cover Requirements. Direct-buried cable, conduit, or other raceways shall be installed to meet the minimum cover requirements of Table 300.5(A).</p> <p>(B) Wet Locations. The interior of enclosures or raceways installed underground shall be considered to be a wet location. Insulated conductors and cables installed in these enclosures or raceways in underground installations shall comply with 310.10(C).</p> <p>(C) Underground Cables and Conductors Under Buildings. Underground cable and conductors installed under a building shall be in a raceway.</p> <p>(D) Protection from Damage. Conductors and cables shall be protected from damage in accordance with 300.5(D)(1) through (D)(4).</p> <ol style="list-style-type: none"> (1) Emerging from Grade. Direct-buried conductors and cables emerging from grade and specified in Columns 1 and 4 of Table 300.5(A) shall be protected by enclosures or raceways extending from the minimum cover distance below grade required by 300.5(A) to a point at least 2.5 m (8 ft) above finished grade. In no case shall the protection be required to exceed 450 mm (18 in.) below finished grade. (2) Conductors Entering Buildings. Conductors entering a building shall be protected to the point of entrance. (3) Service Conductors. Underground service conductors that are not encased in concrete and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation. (4) (4) Enclosure or Raceway Damage. Where the enclosure or raceway is subject to physical damage, the conductors shall be installed in electrical metallic tubing, rigid metal conduit, intermediate metal conduit, RTRC-XW, Schedule 80 PVC conduit, or equivalent. 	New Seattle amendment: Strike footnote #6 to Table 300.5 (A) Minimum Cover Requirements in order to exclude EMT from direct burial applications. Seattle wants to continue its prohibition of EMT in these outside applications.

				<p>(E) Splices and Taps. Direct-buried conductors or cables shall be permitted to be spliced or tapped without the use of splice boxes. The splices or taps shall be made in accordance with 110.14(B).</p> <p>(F) Backfill. Backfill that contains large rocks, paving materials, cinders, large or sharply angular substances, or corrosive material shall not be placed in an excavation where materials might damage raceways, cables, conductors, or other substructures or prevent adequate compaction of fill or contribute to corrosion of raceways, cables, or other substructures.</p> <p>Where necessary to prevent physical damage to the raceway, cable, or conductor, protection shall be provided in the form of granular or selected material, suitable running boards, suitable sleeves, or other approved means.</p> <p>(G) Raceway Seals.</p> <p>Conduits or raceways through which moisture might 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.</p> <p style="text-align: center;">Informational Note: Presence of hazardous gases or vapors might also necessitate the sealing of underground conduits or raceways entering buildings.</p> <p>(H) Bushing. A bushing, or terminal fitting, with an integral bushed opening shall be used at the end of a conduit or other raceway that terminates underground where the conductors or cables emerge as a direct burial wiring method. A seal incorporating the physical protection characteristics of a bushing shall be permitted to be used in lieu of a bushing.</p> <p>(I) Conductors of the Same Circuit. All conductors of the same circuit and, where used, the grounded conductor and all equipment grounding conductors shall be installed in the same raceway or cable or shall be installed in close proximity in the same trench.</p> <p><i>Exception No. 1: Conductors shall be permitted to be installed in parallel in raceways, multiconductor cables, or direct-buried single conductor cables. Each raceway or multiconductor cable shall contain all conductors of the same circuit, including equipment grounding conductors. Each direct-buried single conductor cable shall be located in close proximity in the trench to the other single conductor cables in the same parallel set of conductors in the circuit, including equipment grounding conductors.</i></p> <p><i>Exception No. 2: Isolated phase, polarity, grounded conductor, and equipment grounding and bonding conductor installations shall be permitted in nonmetallic raceways or cables with a nonmetallic covering or nonmagnetic sheath in close proximity where conductors are paralleled as permitted in 310.10(G), and where the conditions of 300.20(B) are met.</i></p> <p>(J) Earth Movement. Where direct-buried conductors, raceways, or cables are subject to movement by settlement or frost, direct-buried conductors, raceways, or cables shall be arranged so as to prevent damage to the enclosed conductors or to equipment connected to the raceways.</p> <p style="text-align: center;">Informational Note: This section recognizes “S” loops in underground direct burial cables and conductors to raceway transitions, expansion fittings in raceway risers to fixed equipment, and, generally, the provision of flexible connections to equipment subject to settlement or frost heaves.</p>	
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				<p>(K) Directional Boring. Cables or raceways installed using directional boring equipment shall be approved for the purpose.</p> <p>Table 300.5(A) Minimum Cover Requirements, 0 to 1000 Volts ac, 1500 Volts dc, Nominal, Burial in Millimeters (Inches)</p> <p>¹ A lesser depth shall be permitted where specified in the installation instructions of a listed low-voltage lighting system.</p> <p>² A depth of 150 mm (6 in.) shall be permitted for pool, spa, and fountain lighting, installed in a nonmetallic raceway, limited to not more than 30 volts where part of a listed low-voltage lighting system.</p> <p>Notes:</p> <ol style="list-style-type: none"> Cover shall be defined as the shortest distance in mm (in.) measured between a point on the top surface of any direct-buried conductor, cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover. Raceways approved for burial only where concrete encased shall require a concrete envelope not less than 50 mm (2 in.) thick. Lesser depths shall be permitted where cables and conductors rise for terminations or splices or where access is otherwise required. Where one of the wiring method types listed in Columns 1 through 3 is used for one of the circuit types in Columns 4 and 5, the shallowest depth of burial shall be permitted. Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in a metal raceway, or a nonmetallic raceway permitted for direct burial. The raceways shall be covered by a minimum of 50 mm (2 in.) of concrete extending down to rock. <p>((6. Directly buried electrical metallic tubing (EMT) shall comply with 358.10.))</p>	
N	300.11	Securing and Supporting	<p>300.11 Securing and Supporting.</p> <p>(A) Secured in Place. Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place.</p> <p>(B) Wiring Systems Installed Above Suspended Ceilings. Support wires that do not provide secure support shall not be permitted as the sole support. Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support. Where independent support wires are used, they shall be secured at both ends. Cables and raceways shall not be supported by ceiling grids.</p> <p>Δ (1) Fire-Rated Assemblies. Wiring located within the cavity of a fire-rated floor-ceiling or roof-ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided and shall be permitted to be attached to the assembly. Where independent support wires are used, they shall be</p>	<p>300.11 Securing and Supporting.</p> <p>(A) Secured in Place. Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place.</p> <p>(B) Wiring Systems Installed Above Suspended Ceilings. Support wires that do not provide secure support shall not be the sole support. Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support. Where independent support wires are used, they shall be secured at both ends. Cables and raceways shall not be supported by ceiling grids.</p> <p>(1) Fire-Rated Assemblies. Wiring located within the cavity of a fire-rated floor-ceiling or roof-ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided and shall be permitted to be attached to the assembly. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means from those that are part of the fire-rated design.</p>	Keep 2020 amendments and overlay on 2023 NEC language.

distinguishable by color, tagging, or other effective means from those that are part of the fire-rated design.

Exception: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.

Informational Note: One method of determining fire rating is testing in accordance with ANSI/ASTM E119-18b, *Standard Test Methods for Fire Tests of Building Construction and Materials*.

- (2) **Non-Fire-Rated Assemblies.** Wiring located within the cavity of a non-fire-rated floor-ceiling or roof-ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided and shall be permitted to be attached to the assembly. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means.

Exception: The ceiling support system shall be permitted to support branch-circuit wiring and associated equipment where installed in accordance with the ceiling system manufacturer's instructions.

(3) **Suspended Ceilings.**

- (a) NEC power limited, Class 2, and Class 3 cables must be secured in compliance with section 334.30 and must be secured to boxes in compliance with section 314.17 of this Code.
- (b) Telecommunications cables must be secured in a manner that will not cause damage to the cables and at intervals not exceeding five feet. Cables are considered adequately supported when run through holes in building structural elements or other supporting elements. Telecommunications cables may be fished into inaccessible hollow spaces of finished buildings. Clamps or fittings are not required where telecommunications cables enter boxes.
- (c) Optical fiber cables must be secured in a manner that will not cause damage to the cables and at intervals not exceeding five feet. Cables are considered adequately supported when run through holes in building structural elements or other supporting elements. Optical fiber cables may be fished into inaccessible hollow spaces of finished buildings. Supports must allow a bending radius that will not cause damage to the cables.
- (d) Where not restricted by the building code official or Article 300 of this Code, the wires required in Section 300.11(A) of this Code may support raceways, cables, or boxes under the following conditions:
- (1) Raceways or cables are not larger than three-quarter-inch trade size;
 - (2) No more than two raceways or cables are supported by a support wire. The two-cable limitation does not apply to telecommunications cables, Class 2 cables, or Class 3 cables on support wires installed

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Informational Note: See ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, for one method of testing to determine fire rating.

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 - b. Optical fiber cables must be secured in a manner that will not cause damage to the cables and at intervals not exceeding five feet. Cables are considered adequately supported when run through holes in building structural elements or other supporting elements. Optical fiber cables may be fished into inaccessible hollow spaces of finished buildings. Supports must allow a bending radius that will not cause damage to the cables.
 - c. Where not restricted by the building code official or Article 300 of this Code, the wires required in Section 300.11(A) of this Code may support raceways, cables, or boxes under the following conditions:
 - (1) Raceways or cables are not larger than three-quarter-inch trade size;
 - (2) No more than two raceways or cables are supported by a support wire. The two-cable limitation does not apply to telecommunications cables, Class 2 cables, or Class 3 cables on support wires installed exclusively for such cables. The support wire must be adequate to carry the cable(s) weight and all attached cables must be secured with approved fittings; or
 - (3) Raceways and cables are secured to the support wires by fittings designed and manufactured for the purpose. In addition to (1),

			<p><u>exclusively for such cables. The support wire must be adequate to carry the cable(s) weight and all attached cables must be secured with approved fittings; or</u></p> <p><u>(3) Raceways and cables are secured to the support wires by fittings designed and manufactured for the purpose.</u></p> <p><u>In addition to (1), (2), and (3) of this subsection, the following conditions must be complied with:</u></p> <p><u>(4) The support wires are minimum #12 AWG and are securely fastened to the structural ceiling and to the ceiling grid system; and</u></p> <p><u>(5) The raceways or cables serve equipment that is located within the ceiling cavity or is mounted on or supported by the ceiling grid system. Telecommunications cables, Class 2 cables, or Class 3 cables supported as required by this section, may pass through ceiling cavities without serving equipment mounted on or supported by the ceiling grid system.</u></p> <p><u>Informational Note: WAC 296-46B-300.011 requirements for support of raceways, cables, or boxes in suspended ceilings is incorporated herein.</u></p> <p>(C) Raceways Used as Means of Support. Raceways shall be used only as a means of support for other raceways, cables, or nonelectrical equipment under any of the following conditions:</p> <ol style="list-style-type: none"> (1) Where the raceway or means of support is identified as a means of support (2) Where the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits (3) Where the raceway is used to support boxes or conduit bodies in accordance with 314.23 or to support luminaires in accordance with 410.36(E) <p>(D) Cables Not Used as Means of Support. Cable wiring methods shall not be used as a means of support for other cables, raceways, or nonelectrical equipment.</p>	<p><u>(2), and (3) of this subsection, the following conditions must be complied with:</u></p> <p><u>(4) The support wires are minimum #12 AWG and are securely fastened to the structural ceiling and to the ceiling grid system; and</u></p> <p><u>(5) The raceways or cables serve equipment that is located within the ceiling cavity or is mounted on or supported by the ceiling grid system. Telecommunications cables, Class 2 cables, or Class 3 cables supported as required by this section, may pass through ceiling cavities without serving equipment mounted on or supported by the ceiling grid system.</u></p> <p><u>Informational Note: WAC 296-46B-300.011 requirements for support of raceways, cables, or boxes in suspended ceilings is incorporated herein.</u></p> <p>(C) Raceways Used as Means of Support. Raceways shall be used only as a means of support for other raceways, cables, or nonelectrical equipment under any of the following conditions:</p> <ol style="list-style-type: none"> (1) Where the raceway or means of support is identified as a means of support (2) Where the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 or Class 3 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits (3) Where the raceway is used to support boxes or conduit bodies in accordance with 314.23 or to support luminaires in accordance with 410.36(E) <p>(D) Cables Not Used as Means of Support. Cable wiring methods shall not be used as a means of support for other cables, raceways, or nonelectrical equipment.</p>	
S	300.15	Boxes, Conduit Bodies, or Fittings—Where Required	<p>300.15 Boxes, Conduit Bodies, or Fittings—Where Required. A box shall be installed at each outlet and switch point of concealed knob-and-tube wiring.</p> <p>Fittings and connectors shall be used only with the specific wiring methods for which they are designed and listed.</p> <p>Where the wiring method is conduit, tubing, Type AC cable, Type MC cable, Type MI cable, nonmetallic-sheathed cable, or other cables, a box or conduit body shall be installed at each conductor splice point, outlet point, switch point, junction point, termination point, or pull point, unless otherwise permitted in 300.15(A) through (L).</p>	<p>300.15 Boxes, Conduit Bodies, or Fittings — Where Required. A box shall be installed at each outlet, <u>non-soldered splice point</u>, and switch point for concealed knob-and-tube wiring.</p> <p>Fittings and connectors shall be used only with the specific wiring methods for which they are designed and listed.</p> <p>Where the wiring method is conduit, tubing, Type AC cable, Type MC cable, Type MI cable, nonmetallic-sheathed cable, or other cables, a box or conduit body shall be installed at each outlet point, switch point, conductor splice point, conductor junction</p>	<p>Remove strike through on 300.15(E) and “(E) Reserved” to allow “sill-lite” box-less receptacles and update with NEC changes.</p>

		<p>(A) Wiring Methods with Interior Access. A box or conduit body shall not be required for each splice, junction, switch, pull, termination, or outlet points in wiring methods with removable covers, such as wireways, multioutlet assemblies, auxiliary gutters, and surface raceways. The covers shall be accessible after installation.</p> <p>(B) Equipment. An integral junction box or wiring compartment as part of approved equipment shall be permitted in lieu of a box.</p> <p>(C) Protection. A box or conduit body shall not be required where cables enter or exit from conduit or tubing that is used to provide cable support or protection against physical damage. A fitting shall be provided on the end(s) of the conduit or tubing to protect the cable from abrasion.</p> <p>(D) Type MI Cable. A box or conduit body shall not be required where accessible fittings are used for straight- through splices in mineral-insulated metal-sheathed cable.</p> <p>(E) Integral Enclosure. A wiring device with integral enclosure identified for the use, having brackets that securely fasten the device to walls or ceilings of conventional onsite frame construction, for use with nonmetallic sheathed cable, shall be permitted in lieu of a box or conduit body.)</p> <p>(E) Reserved.</p> <p><small>Informational Note: See 334.30(C); 545.10; 550.15(I); 551.47(E), Exception No. 1; and 552.48(E), Exception No. 1.</small></p> <p>(F) Fitting. A fitting identified for the use shall be permitted in lieu of a box or conduit body where conductors are not spliced or terminated within the fitting. The fitting shall be accessible after installation, unless listed for concealed installation.</p> <p>(G) Direct-Buried Conductors. As permitted in 300.5(E), a box or conduit body shall not be required for splices and taps in direct-buried conductors and cables.</p> <p>(H) Insulated Devices. As permitted in 334.40(B), a box or conduit body shall not be required for insulated devices supplied by nonmetallic-sheathed cable.</p> <p>(I) Enclosures. A box or conduit body shall not be required where a splice, switch, terminal, or pull point is in a cabinet or cutout box, in an enclosure for a switch or overcurrent device as permitted in 312.8, in a motor controller as permitted in 430.10(A), or in a motor control center.</p> <p>(J) Luminaires. A box or conduit body shall not be required where a luminaire is used as a raceway as permitted in 410.64.</p> <p>(K) Embedded. A box or conduit body shall not be required for splices where conductors are embedded as permitted in 424.40, 424.41(D), 426.22(B), 426.24(A), and 427.19(A).</p> <p>(L) Manholes and Handhole Enclosures. A box or conduit body shall not be required for conductors in manholes or handhole enclosures, except where connecting to electrical equipment. The installation shall comply with the provisions of Part V of Article 110 for manholes, and 314.30 for handhole enclosures.</p>	<p>point, conductor termination point, wiring method transition point, or conductor pull point, unless otherwise permitted in 300.15(A) through (L).</p> <p>(A) Wiring Methods with Interior Access. A box or conduit body shall not be required for each splice, junction, switch, pull, termination, or outlet points in wiring methods with removable covers, such as wireways, multioutlet assemblies, auxiliary gutters, and surface raceways. The covers shall be accessible after installation.</p> <p>(B) Equipment. An integral junction box or wiring compartment as part of approved equipment shall be permitted in lieu of a box.</p> <p>(C) Protection. A box or conduit body shall not be required where cables enter or exit from conduit or tubing that is used to provide cable support or protection against physical damage. A fitting shall be provided on the end(s) of the conduit or tubing to protect the cable from abrasion.</p> <p>(D) Type MI Cable. A box or conduit body shall not be required where accessible fittings are used for straight-through splices in mineral-insulated metal-sheathed cable.</p> <p>(E) Integral Enclosure. A wiring device with integral enclosure identified for the use, having brackets that securely fasten the device to walls or ceilings of conventional onsite frame construction, for use with nonmetallic-sheathed cable, shall be permitted in lieu of a box or conduit body.</p> <p><small>Informational Note: See 334.30(C); 545.10; 550.15(I); 551.47(E), Exception No. 1; and 552.48(E), Exception No. 1.</small></p> <p>(F) Fitting. A fitting identified for the use shall be permitted in lieu of a box or conduit body where conductors are not spliced or terminated within the fitting. The fitting shall be accessible after installation, unless listed for concealed installation.</p> <p>(G) Direct-Buried Conductors and Cables. As permitted in 300.5(E), a box or conduit body shall not be required for splices and taps in direct-buried conductors and cables.</p> <p>(H) Insulated Devices. As permitted in 334.40(B), a box or conduit body shall not be required for insulated devices supplied by nonmetallic-sheathed cable.</p> <p>(I) Enclosures. A box or conduit body shall not be required where a splice, switch, terminal, or pull point is in a cabinet or cutout box, in an enclosure for a switch or overcurrent device as permitted in 312.8, in a motor controller as permitted in 430.10(A), or in a motor control center.</p> <p>(J) Luminaires. A box or conduit body shall not be required where a luminaire is used as a raceway as permitted in 410.64.</p> <p>(K) Embedded. A box or conduit body shall not be required for splices where conductors are embedded as permitted in 424.40, 424.41(D), 426.22(C), 426.24(A), and 427.19(A).</p> <p>(L) Manholes and Handhole Enclosures. A box or conduit body shall not be required for conductors in manholes or handhole enclosures, except where connecting to electrical equipment. The installation shall comply with Part V of Article 110 for manholes, and 314.30 for handhole enclosures.</p>	
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N	300.19	300.19 Supporting Conductors and Cable Assemblies in Vertical (Raceways) Installations.	300.19 Supporting Conductors and Cable Assemblies in Vertical ((Raceways)) Installations. (A) Spacing Intervals—Maximum. Conductors and cables in vertical ((raceways)) installations shall be supported if the vertical rise exceeds the values in Table 300.19(A). At least one support method shall be provided for each conductor at the top of the vertical ((raceway)) installation or as close to the top as practical. Intermediate supports shall be provided as necessary to limit supported ((conductor)) lengths to not greater than those values specified in Table 300.19(A). <i>Exception: Steel wire armor cable shall be supported at the top of the riser with a cable support that clamps the steel wire armor. A safety device shall be permitted at the lower end of the riser to hold the cable in the event there is slippage of the cable in the wire-armored cable support. Additional wedge-type supports shall be permitted to relieve the strain on the equipment terminals caused by expansion of the cable under load.</i> (B) Fire-Rated Cables and Conductors. Support methods and spacing intervals for fire-rated cables and conductors shall comply with any restrictions provided in the listing of the electrical circuit protective system used and in no case shall exceed the values in Table 300.19(A). (C) Support Methods. One of the following methods of support shall be used: (1) Clamping devices constructed of or employing insulating wedges inserted in the ends of the raceways. Where clamping of insulation does not adequately support the cable, the conductor also shall be clamped. (2) Inserting boxes at the required intervals in which insulating supports are installed and secured in an approved manner to withstand the weight of the conductors attached thereto, the boxes being provided with covers. (3) In junction boxes, deflecting the cables not less than 90 degrees and carrying them horizontally to a distance not less than twice the diameter of the cable, the cables being carried on two or more insulating supports and additionally secured thereto by tie wires, if desired. Where this method is used, cables shall be supported at intervals not greater than 20 percent of the support spacing in Table 300.19(A). (4) Other approved means.	300.19 Supporting Conductors and Cable Assemblies in Vertical ((Raceways)) Installations. (A) Spacing Intervals — Maximum. Conductors and cables in vertical ((raceways)) installations shall be supported if the vertical rise exceeds the values in Table 300.19(A). At least one support method shall be provided for each conductor at the top of the vertical ((raceway)) installation or as close to the top as practical. Intermediate supports shall be provided as necessary to limit supported ((conductor)) lengths to not greater than those values specified in Table 300.19(A). <i>Exception: Steel wire armor cable shall be supported at the top of the riser with a cable support that clamps the steel wire armor. A safety device shall be permitted at the lower end of the riser to hold the cable in the event there is slippage of the cable in the wire-armored cable support. Additional wedge-type supports shall be permitted to relieve the strain on the equipment terminals caused by expansion of the cable under load.</i> (B) Fire-Resistive Cables and Conductors. Support methods and spacing intervals for fire-resistive cables and conductors shall comply with any restrictions provided in the listing of the electrical circuit protective system or fire-resistive cable system used and in no case shall exceed the values in Table 300.19(A). (C) Support Methods. One of the following methods of support shall be used: (1) Clamping devices constructed of or employing insulating wedges inserted in the ends of the raceways. Where clamping of insulation does not adequately support the cable, the conductor also shall be clamped. (2) Inserting boxes at the required intervals in which insulating supports are installed and secured in an approved manner to withstand the weight of the conductors attached thereto, the boxes being provided with covers. (3) In junction boxes, deflecting the cables not less than 90 degrees and carrying them horizontally to a distance not less than twice the diameter of the cable, with the cables being carried on two or more insulating supports and additionally secured thereto by tie wires, if desired. Where this method is used, cables shall be supported at intervals not greater than 20 percent of the support spacing in Table 300.19(A). (4) Other approved means.	Minimal NEC changes adding “fire-resistive” language in (B) describing support methods for fire-resistive cables and systems. Carrying over 2020 SEC amendments and overlaying on 2023 NEC language.
N	300.21	300.21 Spread of Fire or Products of Combustion	300.21 Spread of Fire or Products of Combustion. Electrical installations in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around electrical penetrations into or through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating. <u>All out-of-service cable shall be removed from accessible ceiling spaces.</u> Informational Note <u>No. 1:</u> Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire-resistance-rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall.	300.21 Spread of Fire or Products of Combustion. Electrical installations in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around electrical penetrations into or through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating. . <u>All out-of-service cable shall be removed from accessible ceiling spaces</u> Informational Note <u>No. 1:</u> Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire-resistance-rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with the	Minimal NEC changes in informational note: added <u>the requirements of 300.21</u> Carry over 2020 SEC amendments and overlay onto 2023 NEC.

			<p>Assistance in complying with 300.21 can be found in building codes, fire resistance directories, and product listings.</p> <p><u>Informational Note No. 2: See also Chapter 9 of the Seattle Building Code for fire protection systems and protection of penetrations of those systems</u></p>	<p>requirements of 300.21 can be found in building codes, fire resistance directories, and product listings.</p> <p><u>Informational Note No. 2: See also Chapter 9 of the Seattle Building Code for fire protection systems and protection of penetrations of those systems</u></p>	
N	314.23	Supports	<p>314.23 Supports. Enclosures within the scope of this article shall be supported in accordance with one or more of the provisions in 314.23(A) through (H).</p> <p>(A) Surface Mounting. An enclosure mounted on a building or other surface shall be rigidly and securely fastened in place. If the surface does not provide rigid and secure support, additional support in accordance with other provisions of this section shall be provided.</p> <p>(B) Structural Mounting. An enclosure supported from a structural member or from grade shall be rigidly supported either directly or by using a metal, polymeric, or wood brace.</p> <p>(1) Nails and Screws. Nails and screws, where used as a fastening means, shall secure boxes by using brackets on the outside of the enclosure, or by using mounting holes in the back or in one or more sides of the enclosure, or they shall pass through the interior within 6 mm (1/4 in.) of the back or ends of the enclosure. Screws shall not be permitted to pass through the box unless exposed threads in the box are protected using approved means to avoid abrasion of conductor insulation. Mounting holes made in the field shall be approved.</p> <p>(2) Braces. Metal braces shall be protected against corrosion and formed from metal that is not less than 0.51 mm (0.020 in.) thick uncoated. Wood braces shall have a cross section not less than nominal 25 mm × 50 mm (1 in. × 2 in.). Wood braces in wet locations shall be treated for the conditions. Polymeric braces shall be identified as being suitable for the use.</p> <p>(C) Mounting in Finished Surfaces. An enclosure mounted in a finished surface shall be rigidly secured thereto by clamps, anchors, or fittings identified for the application.</p> <p>(D) Suspended Ceilings. An enclosure mounted to structural or supporting elements of a suspended ceiling shall be not more than 1650 cm³ (100 in.³) in size and shall be securely fastened in place in accordance with either 314.23(D)(1) or (D)(2).</p> <p>(1) Framing Members. An enclosure shall be fastened to the framing members by mechanical means such as bolts, screws, or rivets, or by the use of clips or other securing means identified for use with the type of ceiling framing member(s) and enclosure(s) employed. The framing members shall be supported in an approved manner and securely fastened to each other and to the building structure.</p> <p>(2) Support Wires. The installation shall comply with 300.11(A). The enclosure shall be secured, using identified methods, to ceiling support wire(s), including any additional support wire(s) installed for ceiling support. Support wire(s) used for enclosure support shall be fastened at each end so as to be taut within the ceiling cavity.</p> <p>(E) Raceway-Supported Enclosure, Without Devices, Luminaires, or Lampholders. An enclosure that does not contain a device(s), other than splicing devices, or supports a luminaire(s), a lampholder, or other equipment and is supported by entering raceways shall not exceed 1650 cm³ (100 in.³) in size. It</p>	<p>314.23 Supports. Enclosures within the scope of this article shall be supported in accordance with 314.23(A) through (H) as applicable.</p> <p>(A) Surface Mounting. An enclosure mounted on a building or other surface shall be rigidly and securely fastened in place. If the surface does not provide rigid and secure support, additional support in accordance with this section shall be provided.</p> <p>(B) Structural Mounting. An enclosure supported from a structural member or from grade shall be rigidly supported either directly or by using a metal, polymeric, or wood brace.</p> <p>(1) Nails and Screws. Nails and screws, where used as a fastening means, shall secure boxes by using brackets on the outside of the enclosure, or by using mounting holes in the back or in one or more sides of the enclosure, or they shall pass through the interior within 6 mm (1/4 in.) of the back or ends of the enclosure. Screws shall not be permitted to pass through the box unless exposed threads in the box are protected using approved means to avoid abrasion of conductor insulation. Mounting holes made in the field shall be approved.</p> <p>(2) Braces. Metal braces shall be protected against corrosion and formed from metal that is not less than 0.51 mm (0.020 in.) thick uncoated. Wood braces shall have a cross section not less than nominal 25 mm × 50 mm (1 in. × 2 in.). Wood braces in wet locations shall be treated for the conditions. Polymeric braces shall be identified as being suitable for the use.</p> <p>(C) Mounting in Finished Surfaces. An enclosure mounted in a finished surface shall be rigidly secured thereto by clamps, anchors, or fittings identified for the application.</p> <p>(D) Suspended Ceilings. An enclosure mounted to structural or supporting elements of a suspended ceiling shall be not more than 1650 cm³ (100 in.³) in size and shall be securely fastened in place in accordance with either 314.23(D)(1) or (D)(2).</p> <p>(1) Framing Members. An enclosure shall be fastened to the framing members by mechanical means such as bolts, screws, or rivets, or by the use of clips or other securing means identified for use with the type of ceiling framing member(s) and enclosure(s) employed. The framing members shall be supported in an approved manner and securely fastened to each other and to the building structure.</p> <p>(2) Support Wires. The installation shall comply with 300.11(B). The enclosure shall be secured, using identified methods, to ceiling support wire(s), including any additional support wire(s) installed for ceiling support. Support wire(s) used for enclosure support shall be fastened at each end so as to be taut within the ceiling cavity.</p> <p>(E) Raceway-Supported Enclosure, Without Devices, Luminaires, or Lampholders. An enclosure that does not contain a device(s), other than splicing devices, or supports a luminaire(s), a lampholder, or other equipment and is supported by entering raceways shall not exceed 1650 cm³ (100 in.³) in size. It shall have threaded entries or identified hubs. It shall be supported by two or more conduits threaded wrenchtight into the enclosure or hubs. Each conduit shall be secured within</p>	<p>NEC change: Pendant box with flexible cord: A connection to a box equipped with a hub shall be made with a listed cord grip attachment fitting marked for use with a threaded hub.</p> <p>Also removed (A)...additional support in accordance with other provisions of this section shall be provided.</p> <p>Carry over 2020 SEC amendments and overlay on 2023 NEC.</p>

	<p>shall have threaded entries or identified hubs. It shall be supported by two or more conduits threaded wrenchtight into the enclosure or hubs. Each conduit shall be secured within 900 mm (3 ft) of the enclosure, or within 450 mm (18 in.) of the enclosure if all conduit entries are on the same side.</p> <p><i>Exception: The following wiring methods shall be permitted to support a conduit body of any size, including a conduit body constructed with only one conduit entry, provided that the trade size of the conduit body is not larger than the largest trade size of the conduit or tubing:</i></p> <ol style="list-style-type: none"> (1) Intermediate metal conduit, Type IMC (2) Rigid metal conduit, Type RMC (3) Rigid polyvinyl chloride conduit, Type PVC (4) Reinforced thermosetting resin conduit, Type RTRC (5) Electrical metallic tubing, Type EMT <p>(F) Raceway-Supported Enclosures, with Devices, Luminaires, or Lampholders. An enclosure that contains a device(s), other than splicing devices, or supports a luminaire(s), a lampholder, or other equipment and is supported by entering raceways shall not exceed 1650 cm³ (100 in.³) in size. It shall have threaded entries or identified hubs. It shall be supported by two or more conduits threaded wrenchtight into the enclosure or hubs. Each conduit shall be secured within 450 mm (18 in.) of the enclosure.</p> <p><i>Exception No. 1: Rigid metal or intermediate metal conduit shall be permitted to support a conduit body of any size, including a conduit body constructed with only one conduit entry, provided the trade size of the conduit body is not larger than the largest trade size of the conduit.</i></p> <p><i>Exception No. 2: An unbroken length(s) of rigid or intermediate metal conduit shall be permitted to support a box used for luminaire or lampholder support, or to support a wiring enclosure that is an integral part of a luminaire and used in lieu of a box in accordance with 300.15(B), where all of the following conditions are met:</i></p> <ol style="list-style-type: none"> (1) The conduit is securely fastened at a point so that the length of conduit beyond the last point of conduit support does not exceed 900 mm (3 ft). (2) The unbroken conduit length before the last point of conduit support is 300 mm (12 in.) or greater, and that portion of the conduit is securely fastened at some point not less than 300 mm (12 in.) from its last point of support. (3) Where accessible to unqualified persons, the luminaire or lampholder, measured to its lowest point, is at least 2.5 m (8 ft) above grade or standing area and at least 900 mm (3 ft) measured horizontally to the 2.5 m (8 ft) elevation from windows, doors, porches, fire escapes, or similar locations. (4) A luminaire supported by a single conduit does not exceed 300 mm (12 in.) in any direction from the point of conduit entry (5) The weight supported by any single conduit does not exceed 9 kg (20 lb). (6) At the luminaire or lampholder end, the conduit(s) is threaded wrenchtight into the box, conduit body, integral wiring enclosure, or identified hubs. Where a box or conduit body is used for support, the luminaire shall be secured directly to the box or conduit body, or through a threaded conduit nipple not over 75 mm (3 in.) long. <p>(G) Enclosures in Concrete or Masonry. An enclosure supported by embedment shall be identified as suitably protected from corrosion and securely embedded in concrete or masonry.</p> <p>(H) Pendant Boxes. An enclosure supported by a pendant shall comply with 314.23(H)(1) or (H)(2).</p>	<p>900 mm (3 ft) of the enclosure, or within 450 mm (18 in.) of the enclosure if all conduit entries are on the same side.</p> <p><i>Exception: The following wiring methods shall be permitted to support a conduit body of any size, including a conduit body constructed with only one conduit entry, provided that the trade size of the conduit body is not larger than the largest trade size of the conduit or tubing:</i></p> <ol style="list-style-type: none"> (1) Intermediate metal conduit, IMC (2) Rigid metal conduit, RMC (3) Rigid polyvinyl chloride conduit, PVC (4) Reinforced thermosetting resin conduit, RTRC (5) Electrical metallic tubing, EMT <p>(F) Raceway-Supported Enclosures, with Devices, Luminaires, or Lampholders. An enclosure that contains a device(s), other than splicing devices, or supports a luminaire(s), a lampholder, or other equipment and is supported by entering raceways shall not exceed 1650 cm³ (100 in.³) in size. It shall have threaded entries or identified hubs. It shall be supported by two or more conduits threaded wrenchtight into the enclosure or hubs. Each conduit shall be secured within 450 mm (18 in.) of the enclosure.</p> <p><i>Exception No. 1: Rigid metal or intermediate metal conduit shall be permitted to support a conduit body of any size, including a conduit body constructed with only one conduit entry, provided the trade size of the conduit body is not larger than the largest trade size of the conduit.</i></p> <p><i>Exception No. 2: An unbroken length(s) of rigid or intermediate metal conduit shall be permitted to support a box used for luminaire or lampholder support, or to support a wiring enclosure that is an integral part of a luminaire and used in lieu of a box in accordance with 300.15(B), where all of the following conditions are met:</i></p> <ol style="list-style-type: none"> (1) The conduit is securely fastened at a point so that the length of conduit beyond the last point of conduit support does not exceed 900 mm (3 ft). (2) The unbroken conduit length before the last point of conduit support is 300 mm (12 in.) or greater, and that portion of the conduit is securely fastened at some point not less than 300 mm (12 in.) from its last point of support. (3) Where accessible to unqualified persons, the luminaire or lampholder, measured to its lowest point, is at least 2.5 m (8 ft) above grade or standing area and at least 900 mm (3 ft) measured horizontally to the 2.5 m (8 ft) elevation from windows, doors, porches, fire escapes, or similar locations. (4) A luminaire supported by a single conduit does not exceed 300 mm (12 in.) in any direction from the point of conduit entry. (5) The weight supported by any single conduit does not exceed 9 kg (20 lb). (6) At the luminaire or lampholder end, the conduit(s) is threaded wrenchtight into the box, conduit body, integral wiring enclosure, or identified hubs. Where a box or conduit body is used for support, the luminaire shall be secured directly to the box or conduit body, or through a threaded conduit nipple not over 75 mm (3 in.) long. <p>(G) Enclosures in Concrete or Masonry. An enclosure supported by embedment shall be identified as suitably protected from corrosion and securely embedded in concrete or masonry.</p> <p>(H) Pendant Boxes. An enclosure supported by a pendant shall comply with 314.23(H)(1) or (H)(2).</p> <ol style="list-style-type: none"> (1) Flexible Cord. A box shall be supported from a multiconductor cord or cable in an approved manner that protects the conductors against strain. A connection to a box equipped with a hub shall be made with a listed cord grip attachment fitting marked for use with a threaded hub. 	
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			<p>(1) Flexible Cord. A box shall be supported from a multiconductor cord or cable in an approved manner that protects the conductors against strain, such as a strain-relief connector threaded into a box with a hub.</p> <p><u>Flexible cord and cord connections must comply with 314.23(H) of this Code and the following:</u></p> <ul style="list-style-type: none"> (a) <u>A suspended pendant box must not contain conduit “knockouts” and connection to a suspended box must utilize an integral threaded hub;</u> (b) <u>The maximum length of the cord for a suspended pendant drop from a permanently installed junction box to a suitable tension take-up device above the pendant box must not exceed six feet;</u> (c) <u>The flexible cord must be supported at each end with an approved cord grip or strain relief connector fitting/device that will eliminate all stress on the conductor connections;</u> (d) <u>The flexible cord must be a minimum No. 14 AWG copper;</u> (e) <u>The flexible cord ampacity must be determined using NEC Table 400.5(A) column A; and</u> (f) <u>The flexible cord must be hard or extra hard usage.</u> <p><u>Informational Note: WAC 296-46B-314-023(H), requirements for flexible cord connection of pendant boxes, is incorporated herein.</u></p> <p>(2) Conduit. A box supporting lampholders or luminaires, or wiring enclosures within luminaires used in lieu of boxes in accordance with 300.15(B), shall be supported by rigid or intermediate metal conduit stems. For stems longer than 450 mm (18 in.), the stems shall be connected to the wiring system with listed swivel hangers suitable for the location. At the luminaire end, the conduit(s) shall be threaded wrenchtight into the box, wiring enclosure, or identified hubs.</p> <p>Where supported by only a single conduit, the threaded joints shall be prevented from loosening by the use of set-screws or other effective means, or the luminaire, at any point, shall be at least 2.5 m (8 ft) above grade or standing area and at least 900 mm (3 ft) measured horizontally to the 2.5 m (8 ft) elevation from windows, doors, porches, fire escapes, or similar locations. A luminaire supported by a single conduit shall not exceed 300 mm (12 in.) in any horizontal direction from the point of conduit entry.</p>	<p><u>Flexible cord and cord connections must comply with 314.23(H) of this Code and the following:</u></p> <ul style="list-style-type: none"> (a) <u>A suspended pendant box must not contain conduit “knockouts” and connection to a suspended box must utilize an integral threaded hub;</u> (b) <u>The maximum length of the cord for a suspended pendant drop from a permanently installed junction box to a suitable tension take-up device above the pendant box must not exceed six feet;</u> (c) <u>The flexible cord must be supported at each end with an approved cord grip or strain relief connector fitting/device that will eliminate all stress on the conductor connections;</u> (d) <u>The flexible cord must be a minimum No. 14 AWG copper;</u> (e) <u>The flexible cord ampacity must be determined using NEC Table 400.5(A) column A; and</u> (f) <u>The flexible cord must be hard or extra hard usage.</u> <p><u>Informational Note: WAC 296-46B-314-023(H), requirements for flexible cord connection of pendant boxes, is incorporated herein.</u></p> <p>(2) Conduit. A box supporting lampholders or luminaires, or wiring enclosures within luminaires used in lieu of boxes in accordance with 300.15(B), shall be supported by rigid or intermediate metal conduit stems. For stems longer than 450 mm (18 in.), the stems shall be connected to the wiring system with listed swivel hangers suitable for the location. At the luminaire end, the conduit(s) shall be threaded wrenchtight into the box, wiring enclosure, or identified hubs.</p> <p>Where supported by only a single conduit, the threaded joints shall be prevented from loosening by the use of set-screws or other effective means, or the luminaire, at any point, shall be at least 2.5 m (8 ft) above grade or standing area and at least 900 mm (3 ft) measured horizontally to the 2.5 m (8 ft) elevation from windows, doors, porches, fire escapes, or similar locations. A luminaire supported by a single conduit shall not exceed 300 mm (12 in.) in any horizontal direction from the point of conduit entry.</p>	
S and N	330.10	330.10 Uses Permitted (Type MC)	<p>330.10 Uses Permitted.</p> <p>(A) General Uses. Type MC cable shall be permitted as follows:</p> <p>(1) For ((services,)) feeders ((,)) and branch circuits, <u>Type _____ MC cable may be used for services provided each of the following conditions are met:</u></p> <ul style="list-style-type: none"> a. <u>Obtain prior approval of the authority having jurisdiction for the specific installation.</u> b. <u>The metallic covering is impervious to moisture.</u> 	<p>330.10 Uses Permitted.</p> <p>(A) General Uses. Type MC cable shall be permitted as follows:</p> <ul style="list-style-type: none"> (1) For ((services,)) feeders((,)) and branch circuits. _ (2) For power, lighting, control, and signal circuits. (3) Indoors or outdoors. (4) Exposed or concealed. (5) To be direct buried where identified for such use. 	<p>SDCI is questioning its current amendment that requires indoor service MC to be impervious to moisture? Was it for outdoor pole mounted applications initially? SDCI recommends eliminating the current 2020 Seattle amendment in (A).</p> <p>We also recommend removing the redundant informational note at the bottom of part (B), as it is a repeat of NEC language: “Informational Note: “The Uses Permitted is not an all- inclusive list.”</p> <p>(B)(3) is also struck which means that MC cable is not allowed for services. Also strike from 230.43.</p>

c. A lead sheath or moisture-impervious jacket is provided under the metal covering.

d. The insulated conductors under the metallic covering are listed for use in wet locations and a corrosion-resistant jacket is provided over the metallic sheath.

- (2) For power, lighting, control, and signal circuits.
- (3) Indoors or outdoors.
- (4) Exposed or concealed.
- (5) To be direct buried where identified for such use.
- (6) In cable tray where identified for such use.
- (7) In any raceway.
- (8) As aerial cable on a messenger.
- (9) In hazardous (classified) locations where specifically permitted by other articles in this Code.
- (10) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations.
- (11) In wet locations where a corrosion-resistant jacket is provided over the metallic covering and any of the following conditions are met:
 - a. The metallic covering is impervious to moisture.
 - b. A jacket resistant to moisture is provided under the metal covering.
 - c. The insulated conductors under the metallic covering are listed for use in wet locations.
- (12) Where single-conductor cables are used, all phase conductors and, where used, the grounded conductor shall be grouped together to minimize induced voltage on the sheath.

(B) Specific Uses. Type MC cable shall be permitted to be installed in compliance with Parts II and III of Article 725 and 770.133 as applicable and in accordance with 330.10(B)(1) through (B)(4).

Informational Note: The "Uses Permitted" is not an all-inclusive list.

(1) Cable Tray. Type MC cable installed in cable tray shall comply with 392.10, 392.12, 392.18, 392.20, 392.22, 392.30, 392.46, 392.56, 392.60(C), and 392.80.

(2) Direct Buried. Direct-buried cable shall comply with 300.5 or 300.50, as appropriate.

(3) Installed as Service-Entrance Cable. Type MC cable installed as service-entrance cable shall be permitted in accordance with 230.43.

(6) In cable tray where identified for such use.

(7) In any raceway.

(8) As aerial cable on a messenger.

(9) In hazardous (classified) locations where specifically permitted by other articles in this Code.

(10) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations.

(11) In damp or wet locations where a corrosion-resistant jacket is provided over the metallic covering and any of the following conditions are met:

- a. The metallic covering is impervious to moisture.
- b. A jacket resistant to moisture is provided under the metal covering.
- c. The insulated conductors under the metallic covering are listed for use in wet locations.

(12) Where single-conductor cables are used, all phase conductors and, where used, the grounded conductor shall be grouped together to minimize induced voltage on the sheath.

(B) Specific Uses. Type MC cable shall be permitted to be installed in compliance with Parts II and III of Article 725 and 770.133 as applicable and in accordance with 330.10(B)(1) through (B)(4).

Informational Note: The "Uses Permitted" is not an all-inclusive list.

(1) Cable Tray. Type MC cable installed in cable tray shall comply with 392.10, 392.12, 392.18, 392.20, 392.22, 392.30, 392.46, 392.56, 392.60(C), and 392.80.

(2) Direct Buried. Direct-buried cable shall comply with 300.5 or 305.15, as appropriate.

~~**(3) Installed as Service-Entrance Cable.** Type MC cable installed as service-entrance cable shall be permitted in accordance with 230.43.~~

(4) Installed Outside of Buildings or Structures or as Aerial Cable. Type MC cable installed outside of buildings or structures or as aerial cable shall comply with 225.10, 396.10, and 396.12.

~~(Informational Note: The "Uses Permitted" is not an all-inclusive list.)~~

			<p>(4) Installed Outside of Buildings or Structures or as Aerial Cable. Type MC cable installed outside of buildings or structures or as aerial cable shall comply with 225.10, 396.10, and 396.12.</p> <p>Informational Note: The “Uses Permitted” is not an all-inclusive list.</p>		
N and S	334.10	Uses Permitted	<p>334.10 Uses Permitted. Type NM and Type NMC cables shall be permitted to be used in the following, except as prohibited in 334.12:</p> <p>(1) One- and two-family dwellings and their attached or detached garages, and their storage buildings.</p> <p>(2) Multi-family dwellings ((permitted to be)) of Types III, IV-HT, and V construction <u>except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.</u></p> <p>(3) Other structures ((permitted to be)) of Types III, IV-HT, and V <u>except as prohibited in 334.12</u> construction. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.</p> <p>Informational Note ((No. 1)): Types of building construction and occupancy classifications ((are defined in NFPA 220–2018, Standard on Types of Building Construction, or the applicable building code, or both))<u>the Seattle Building Code.</u></p> <p>(Informational Note No. 2: See Informative Annex E for determination of building types. [NFPA 220, Table 4.1.1])</p> <p>(4) Cable trays in structures permitted to be Types III, IV-HT, or V where the cables are identified for the use.</p> <p>Informational Note: See 310.14(A)(3) for temperature limitation of conductors.</p> <p>(5) Types I and II construction where installed within raceways permitted to be installed in Types I and II construction.</p> <p>(A) Type NM. Type NM cable shall be permitted as follows:</p> <p>(1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3)</p> <p>(2) To be installed or fished in air voids in masonry block or tile walls</p> <p>(B) Type NMC. Type NMC cable shall be permitted as follows:</p> <p>(1) For (both exposed and) concealed work in dry, moist, damp, or corrosive locations, except as prohibited by 334.10(3)</p> <p>(2) In outside and inside walls of masonry block or tile</p>	<p>334.10 Uses Permitted. Type NM and Type NMC cables shall be permitted to be used in the following, except as prohibited in 334.12:</p> <p>(1) One- and two-family dwellings and their attached or detached garages, and their storage buildings.</p> <p>(2) Multi-family dwellings and their detached garages ((permitted to be)) of Types III, IV, and V construction <u>except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.</u></p> <p>(3) Other structures ((permitted to be)) of Types III, IV-HT, and V <u>except as prohibited in 334.12</u> construction. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.</p> <p>(Informational Note No. 1: See NFPA 220–2021, Standard on Types of Building Construction, or the applicable building code, or both for types of building construction and occupancy classification definitions.)</p> <p>Informational Note ((No. 1)): Types of building construction and occupancy classifications are <u>defined in</u> (NFPA 220–2018, Standard on Types of Building Construction, or the applicable building code, or both)<u>the Seattle Building Code.</u></p> <p>(4) Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.</p> <p>Informational Note No. 3: See 310.14(A)(3) for temperature limitation of conductors.</p> <p>(5) Types I and II construction where installed within raceways permitted to be installed in Types I and II construction.</p> <p>(A) Type NM. Type NM cable shall be permitted as follows:</p> <p>(1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3)</p> <p>(2) To be installed or fished in air voids in masonry block or tile walls</p> <p>(B) Type NMC. Type NMC cable shall be permitted as follows:</p> <p>(1) For (both exposed and) concealed work in dry, wet, damp, or corrosive locations, except as prohibited by 334.10(3)</p> <p>(2) In outside and inside walls of masonry block or tile</p>	<p>SDCI: Struck new NEC 2024 informational note (No. 1) because it is similar to (S) informational note but has extra, inaccurate information SDCI doesn't want.</p> <p>SDCI: Cleaned up existing (S) informational note so it makes more sense.</p> <p>NEC: New--allows detached garages serving multi-family dwelling in Types III, IV, and V to be wired in Romex.</p> <p>NEC: (3) informational note is modified to provide information on what to look for in the building code re: building construction and occupancy classification definitions.</p> <p>Carry over all other (S) amendments from 2020 SEC and overlay on 2023 NEC.</p>

			(3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (1/16 in.) thick and covered with plaster, adobe, or similar finish	(3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (1/16 in.) thick and covered with plaster, adobe, or similar finish	
[W]	334.12	Uses Not Permitted.	<p>334.12 Uses Not Permitted.</p> <p>(A) Types NM and NMC. Types NM and NMC cables shall not be permitted as follows:</p> <ol style="list-style-type: none"> (1) In any dwelling or structure not specifically permitted in 334.10(1), (2), (3), and (5) (2) Exposed within a dropped or suspended ceiling cavity in other than one- and two-family and multifamily dwellings (3) As service-entrance cable (4) In commercial garages having hazardous (classified) locations as defined in 511.3 (5) In theaters and similar locations, except where permitted in 518.4(B) (6) In motion picture studios (7) In storage battery rooms (8) In hoistways or on elevators or escalators (9) Embedded in poured cement, concrete, or aggregate (10) In hazardous (classified) locations, except where specifically permitted by other articles in this Code <p>(B) Type NM. Type NM cables shall not be used under the following conditions or in the following locations:</p> <ol style="list-style-type: none"> (1) Where exposed to corrosive fumes or vapors (2) Where embedded in masonry, concrete, adobe, fill, or plaster (3) In a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish (4) In wet or damp locations 	<p>334.12 Uses Not Permitted.</p> <p>(A) Types NM and NMC. Types NM and NMC cables shall not be permitted as follows:</p> <ol style="list-style-type: none"> (1) In any dwelling or structure not specifically permitted in <u>334.10(1), (2), (3), and (5)</u> (2) Exposed within a dropped or suspended ceiling cavity in other than one- and two-family and multifamily dwellings (3) As service-entrance cable (4) In commercial garages having hazardous (classified) locations as defined in <u>511.3</u> (5) In theaters and similar locations, except where permitted in <u>518.4(C)</u> (6) In motion picture studios (7) In storage battery rooms (8) In hoistways or on elevators or escalators (9) Embedded in poured cement, concrete, or aggregate (10) In hazardous (classified) locations, except where specifically permitted by other articles in this <i>Code</i> <p>(B) Type NM. Type NM cables shall not be used under the following conditions or in the following locations:</p> <ol style="list-style-type: none"> (1) Where exposed to corrosive fumes or vapors (2) Where embedded in masonry, concrete, adobe, fill, or plaster (3) In a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish (4) In wet or damp locations <p><i>Exception to (4): Wet or damp locations do not include the interior of conduits installed in wet locations outdoors used for physical protection of NM cables under the following conditions:</i></p> <p><i>(a) Cables emerging from a building interior, attic, or crawlspace remain unbroken until terminated; and</i></p>	<p>Adding change from the state of WA regarding the definition of wet locations for NM cable. Wet or damp locations do NOT include the interior of conduits installed in wet, outdoors locations. (see exception to (B)(4)).</p> <p>SDCI also recommends placing WAC 296 46B-334 015 (7) into 334.12 (B) as an exception that allows NM in interior raceway to go outside 10 feet. Coming out of a wall of a home</p> <p>(B) (4), exception to 4: Note: Also in WAC 296-46B-334 010 Non-metallic-sheathed cable. Differences between WAC and proposed 2023 SEC in blue shading.</p>

				<p><i>(b) Flexible metal conduits are not used; and</i></p> <p><i>(c) No conduit systems are longer than 10 ft or any portion is below grade; and</i></p> <p><i>(d) Conduits are sealed to prevent air movement and are arranged to naturally drain</i></p>	
S	334.15	Exposed Work.	<p>334.15 Exposed Work. In exposed work, except as provided in 300.11(A), cable shall be installed as specified in 334.15(B) through (C).</p> <p>((A) To Follow Surface. Cable shall closely follow the surface of the building finish or of running boards.))</p> <p>(A) Work Considered as Concealed. Nonmetallic-sheathed cable shall be considered as concealed where installed in inaccessible void areas of buildings or where run between or through bored holes of studs, joists and similar members as required in Section 300.4. All outlet, junction, or device boxes shall be installed as required for concealed work.</p> <p>(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.))</p> <p>Type NMC cable installed in 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.</p> <p><i>Exception: Exposed nonmetallic-sheathed cable that is properly supported may enter the top section only of a surface-mounted main service panel where the distance from the top of the panel to the bottom of the ceiling joist above does not exceed 2 1/2 feet.</i></p> <p>(C) In Unfinished Basements. ((and Crawl Spaces.)) Where cable is run at angles with joists in unfinished basements, ((and crawl spaces,)) it shall be ((permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges 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.)) Conduit or tubing shall be provided with a suitable insulating bushing or adapter at the point the cable enters the raceway. The sheath of the nonmetallic-sheathed cable shall extend through the conduit or tubing and into the outlet or device box not less than 6 mm (1/4 in.). The cable shall be secured within 300 mm (12 in.) of the point where the cable enters the conduit or tubing. Metal conduit, tubing, and metal outlet boxes shall be connected to an equipment grounding conductor complying with the provisions of 250.86 and 250.148.</p>	<p>334.15 Exposed Work. ((In exposed work,)) <u>NM cable shall not be exposed except as ((provided in 300.11(A), cable shall be installed as specified)) allowed in 334.15 (B) through (D) and 334.23.</u></p> <p><u>Nonmetallic-sheathed cable shall be considered as concealed where installed in inaccessible void areas of buildings or where run between or through ((bored holes of)) studs, joists and similar members as required in Section 300.4. All outlet, junction, or device boxes shall be installed as required for concealed work.</u></p> <p><i>Exception: Exposed nonmetallic-sheathed cable that is properly supported may enter the top section only of a surface-mounted ((main service)) panelboard and cabinet where the distance from the top of the panel enclosure to the bottom of the ceiling joist above does not exceed 30 in.</i></p> <p>((A) To Follow Surface. Cable shall closely follow the surface of the building finish or of running boards.))</p> <p>(B) Protection from Physical Damage. <u>Where exposed,</u> cable shall be protected from physical damage ((where necessary)) by rigid metal conduit, intermediate metal conduit, electrical metallic tubing, ((Schedule 80)) PVC conduit, 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, RTRC marked with the suffix -XW, or other approved means extending at least 150 mm (6 in.) above the floor.)) Conduit or tubing shall be provided with a bushing or adapter that provides protection from abrasion at the point the cable enters and exits the raceway.</p> <p>Type NMC cable installed in 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.</p> <p>(C) In Unfinished Basements ((and Crawl Spaces.)) Where cable is run at angles with joists in unfinished basements ((and crawl spaces,)) it shall be ((permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges 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.)). Conduit or tubing shall be provided with a bushing or adapter that provides protection from abrasion at the point the cable enters and exits the raceway. The sheath of the nonmetallic-sheathed cable shall extend through the conduit or tubing and into the outlet, device, or</p>	<p>SDCI recommends: Rerwording 334.15 to: NM cable shall not be exposed except for as allowed in 334.15 (B)-(D) and 334.23.</p> <p>Eliminating the title (A) Work considered as concealed and reverted to NEC numbering.</p> <p>Eliminating the term “bored holes” in the second paragraph. Don’t really need to specify what the holes are like.</p> <p>Relocating 334.15 (B), exception to be the third paragraph of 334.15 and allow for NM cable to connect to all panelboards, not just main service panels, and allow it to be run from the bottom of the ceiling joist to the top of the panel enclosure as long as the distance of the run is less than 30”.</p> <p>Removing a portion of what is essentially a definition of crawl space in 334.15 (D). As it is, most unfinished basements can be defined as crawl spaces. This isn’t needed.</p>

			<p>(D) In Crawl Spaces. Where cable is run at angles with joists in crawl spaces, it shall be permissible to secure cables directly to the lower edges of the joists or through bored holes in the joists. For the purpose of this section, “crawl space” is defined as any unoccupied space of limited height, usually less than a full story but of sufficient height to permit workers access to otherwise concealed ductwork, piping, or wiring, and the space is usually enclosed by a foundation wall.</p>	<p>junction box not less than 6 mm (1/4 in.). The cable shall be secured within 300 mm (12 in.) of the point where the cable enters the conduit or tubing. Metal conduit, tubing, and metal outlet boxes shall be connected to an equipment grounding conductor complying with 250.86 and 250.148.</p> <p>(D) In Crawl Spaces. Where cable is run at angles with joists in crawl spaces, it shall be permissible to secure cables directly to the lower edges of the joists or through bored holes in the joists. For the purpose of this section, “crawl space” is defined as any unoccupied space of limited height, usually less than a full story but of sufficient height to permit workers access to otherwise concealed ductwork, piping, or wiring, and the space is usually enclosed by a foundation wall.</p>	
N & S	336.10	Uses Permitted	<p>336.10 Uses Permitted. Type TC cable shall be permitted to be used as follows:</p> <ol style="list-style-type: none"> (1) For power, lighting, control, and signal circuits. (2) In cable trays, including those with mechanically discontinuous segments up to 300 mm (1 ft). (3) In raceways. (4) In outdoor locations supported by a messenger wire. (5) For Class 1 circuits as permitted in Parts II and III of Article 725. (6) For non-power-limited fire alarm circuits if conductors comply with the requirements of 760.49. (7) Between a cable tray and the utilization equipment or device(s), provided all of the following apply: <ol style="list-style-type: none"> a. The cable is Type TC-ER. b. The cable is installed in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation. c. The cable is continuously supported and protected against physical damage using mechanical protection such as struts, angles, or channels. d. The cable complies with the crush and impact requirements of Type MC cable and is identified with the marking “TC-ER.” e. The cable is secured at intervals not exceeding 1.8 m (6 ft). 	<p>336.10 Uses Permitted. Type TC cable shall be permitted to be used as follows:</p> <ol style="list-style-type: none"> (1) For power, lighting, control, and signal circuits. (2) In cable trays, including those with mechanically discontinuous segments up to 300 mm (1 ft). (3) In raceways. (4) In outdoor locations supported by a messenger wire. (5) For Class 1 circuits as permitted in Parts II and III of Article 725. (6) For non-power-limited fire alarm circuits if conductors comply with the requirements of 760.49. (7) Between a cable tray and the utilization equipment or device(s), provided all of the following apply: <ol style="list-style-type: none"> a. The cable is Type TC-ER. b. The cable is installed in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation. c. The cable is continuously supported and protected against physical damage using mechanical protection such as struts, angles, or channels. d. The cable complies with the crush and impact requirements of Type MC cable and is identified with the marking “TC-ER.” e. The cable is secured at intervals not exceeding 1.8 m (6 ft). 	<p>SDCI recommends striking new 2023 NEC (12), because TC cable would still not be allowed as service entrance conductors. We are also including informational note #2 that was not included in the 2020 SEC even though it was in 2020 NEC. We are realigning the numbering with the NEC.</p>

			<p>f. Equipment grounding for the utilization equipment is provided by an equipment grounding conductor within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119(B).</p> <p><i>Exception to (7): Where not subject to physical damage, Type TC-ER shall be permitted to transition between cable trays and between cable trays and equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support. The cable shall be mechanically supported where exiting the cable tray to ensure that the minimum bending radius is not exceeded</i></p> <p>(8) Type TC cable shall be resistant to moisture and corrosive agents where installed in wet locations.</p> <p>(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.</p> <p><i>Exception: Where used to connect a generator and associated equipment having terminals rated 75°C (140°F) or higher, the cable shall not be limited in ampacity by 334.80 or 340.80.</i></p> <p>Informational Note: See 725.136 for limitations on Class 2 or 3 circuits contained within the same cable with conductors of electric light, power, or Class 1 circuits.</p> <p>(10) Direct buried, where identified for such use.</p> <p>(11) In hazardous (classified) locations where specifically permitted by other articles in this Code.</p> <p><u>(12) In addition to the uses allowed in NEC 336.10, Type TC-ER-JP cable may be used in any location allowed for nonmetallic sheathed cable in NEC 334 if all the installation requirements in NEC 336 and 334 and WAC 296- 46B-334 are met.</u></p>	<p>f. Equipment grounding for the utilization equipment is provided by an equipment grounding conductor within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119(C).</p> <p><i>Exception to (7): Where not subject to physical damage, Type TC-ER shall be permitted to transition between cable trays and between cable trays and equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support. The cable shall be mechanically supported where exiting the cable tray to ensure that the minimum bending radius is not exceeded.</i></p> <p>(8) Type TC cable shall be resistant to moisture and corrosive agents where installed in wet locations.</p> <p>(9) For one- and two-family dwelling units, Type TC-ER-JP cable containing conductors for both power and control circuits 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.</p> <p><i>Exception: Where used to connect a generator and associated equipment having terminals rated 75°C (140°F) or higher, the cable shall not be limited in ampacity by 334.80 or 340.80.</i></p> <p>Informational Note No. 1: See 725.136 for limitations on Class 2 or 3 circuits contained within the same cable with conductors of electric light, power, or Class 1 circuits.</p> <p>(10) Direct buried, where identified for such use.</p> <p>(11) In hazardous (classified) locations where specifically permitted by other articles in this Code.</p> <p>(12) For service-entrance conductors where identified for such use and marked Type TC-ER-Reserved</p> <p><u>(13) In addition to the uses allowed in NEC 336.10, Type TC-ER-JP cable may be used in any location allowed for nonmetallic sheathed cable in NEC 334 if all the installation requirements in NEC 336 and 334 and WAC 296- 46B-334 are met.</u></p> <p>Informational Note No. 2: See 310.14(A)(3) for temperature limitation of conductors.</p>	
S, W	338.10	Uses Permitted.	<p>338.10 Uses Permitted.</p> <p>(A) ((Service-Entrance Conductors. Service-entrance cable shall be permitted to be used as service-entrance conductors and shall be installed in accordance with 230.6, 230.7, and Parts II, III, and IV of Article 230.)) Reserved.</p> <p>(B) Branch Circuits or Feeders.</p> <p>(1) Grounded Conductor Insulated. Type SE service-entrance cables shall be permitted in wiring systems where all of the circuit conductors of the cable are of the thermoset or thermoplastic type.</p> <p>(2) Use of Uninsulated Conductor. Type SE service-entrance cable shall be permitted for use where the insulated conductors are used for circuit wiring and the uninsulated conductor is used only for equipment grounding purposes.</p>	<p>338.10 Uses Permitted.</p> <p>(A) ((Service-Entrance Conductors. Service-entrance cable shall be permitted to be used as service-entrance conductors and shall be installed in accordance with 230.6, 230.7, and Parts II, III, and IV of Article 230.))</p> <p>(B) Branch Circuits or Feeders.</p> <p>(1) Grounded Conductor Insulated. Type SE service-entrance cables shall be permitted in wiring systems where all of the circuit conductors of the cable are of the thermoset or thermoplastic type.</p> <p>(2) Use of Uninsulated Conductor. Type SE service-entrance cable shall be permitted for use where the insulated conductors are used for circuit wiring and the uninsulated conductor is used only for equipment grounding purposes.</p>	Minimal NEC changes. Carry over 2020 amendments and overlay on 2023 NEC. WAC covers this in 230.

			<p><i>Exception: In existing installations, uninsulated conductors shall be permitted as a grounded conductor in accordance with 250.32 and 250.140 where the uninsulated grounded conductor of the cable originates in service equipment, and 225.30 through 225.40.</i></p> <p>(3) Temperature Limitations. Type SE service-entrance cable used to supply appliances shall not be subject to conductor temperatures in excess of the temperature specified for the type of insulation involved.</p> <p>(4) Installation Methods for Branch Circuits and Feeders.</p> <p>Informational Note No. 1: See 310.14(A)(3) for temperature limitation of conductors.</p> <p>Informational Note No. 2: For the installation of main power feeder conductors in dwelling units refer to 310.12.</p> <p>(a) Interior Installations.</p> <p>(1) In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Part II of Article 334, excluding 334.80.</p> <p>(2) Where more than two Type SE cables containing two or more current-carrying conductors in each cable are installed in contact with thermal insulation, caulk, or sealing foam without maintaining spacing between cables, the ampacity of each conductor shall be adjusted in accordance with Table 310.15(C)(1).</p> <p>(3) For Type SE cable with ungrounded conductor sizes 10 AWG and smaller, where installed in contact with thermal insulation, the ampacity shall be in accordance with 60°C (140°F) conductor temperature rating. The maximum conductor temperature rating shall be permitted to be used for ampacity adjustment and correction purposes, if the final ampacity does not exceed that for a 60°C (140°F) rated conductor.</p> <p>(b) Exterior Installations.</p> <p>(1) In addition to the provisions of this article, service-entrance cable used for feeders or branch circuits, where installed as exterior wiring, shall be installed in accordance with Part I of Article 225. The cable shall be supported in accordance with 334.30.</p> <p>(2) Type USE cable installed as underground feeder and branch circuit cable shall comply with Part II of Article 340.</p> <p><i>Exception: Single-conductor Type USE and multi-rated USE conductors shall not be subject to the ampacity limitations of Part II of Article 340</i></p>	<p><i>Exception: In existing installations, uninsulated conductors shall be permitted as a grounded conductor in accordance with 250.32 and 250.140, where the uninsulated grounded conductor of the cable originates in service equipment, and with 225.30 through 225.40.</i></p> <p>(3) Temperature Limitations. Type SE service-entrance cable used to supply appliances shall not be subject to conductor temperatures in excess of the temperature specified for the type of insulation involved.</p> <p>(4) Installation Methods for Branch Circuits and Feeders.</p> <p>(a) Interior Installations. Interior installations shall comply with the following:</p> <p>(1) In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Part II of Article 334, excluding 334.80.</p> <p>(2) Where more than two Type SE cables containing two or more current-carrying conductors in each cable are installed in contact with thermal insulation, caulk, or sealing foam without maintaining spacing between cables, the ampacity of each conductor shall be adjusted in accordance with Table 310.15(C)(1).</p> <p>(3) For Type SE cable with ungrounded conductor sizes 10 AWG and smaller, where installed in contact with thermal insulation, the ampacity shall be in accordance with 60°C (140°F) conductor temperature rating. The maximum conductor temperature rating shall be permitted to be used for ampacity adjustment and correction purposes, if the final ampacity does not exceed that for a 60°C (140°F) rated conductor.</p> <p>(b) Exterior Installations. Exterior installations shall comply with the following:</p> <p>(1) In addition to the provisions of this article, service-entrance cable used for feeders or branch circuits, where installed as exterior wiring, shall be installed in accordance with Part I of Article 225. The cable shall be supported in accordance with 334.30.</p> <p>(2) Type USE cable installed as underground feeder and branch circuit cable shall comply with Part II of Article 340.</p> <p><i>Exception: Single-conductor Type USE and multi-rated USE conductors shall not be subject to the ampacity limitations of Part II of Article 340.</i></p>	
N	338.12	Uses Not Permitted	<p>338.12 Uses Not Permitted.</p> <p>(A) Service-Entrance Cable. Service-entrance cable (SE) shall not be used under the following conditions or in the following locations:</p>	<p>338.12 Uses Not Permitted.</p> <p>(A) Service-Entrance Cable. Type SE cable shall not be used under the following conditions or in the following locations:</p>	Carry over 2020 SEC amendments and overlay on 2023 NEC language.

			<p>(1) Where subject to physical damage unless protected in accordance with 230.50(B)</p> <p>(2) Underground with or without a raceway</p> <p>(3) For exterior branch circuits and feeder wiring unless the installation complies with the provisions of Part I of Article 225 and is supported in accordance with 334.30 or is used as messenger-supported wiring as permitted in Part II of Article 396</p> <p><u>(4) As service entrance conductors</u></p> <p>(B) Underground Service-Entrance Cable. Underground service-entrance cable (USE) shall not be used under the following conditions or in the following locations:</p> <p>(1) For interior wiring</p> <p>(2) For aboveground installations except where USE cable emerges from the ground and is terminated in an enclosure at an outdoor location and the cable is protected in accordance with 300.5(D)</p> <p>(3) As aerial cable unless it is a multiconductor cable identified for use aboveground and installed as messenger-supported wiring in accordance with 225.10 and Part II of Article 396</p> <p><u>(4) As service entrance conductors</u></p>	<p>(1) Where subject to physical damage unless protected in accordance with 230.50(B)</p> <p>(2) Underground with or without a raceway</p> <p>(3) For exterior branch circuits and feeder wiring unless the installation complies with Part I of Article 225 and is supported in accordance with 334.30 or is used as messenger-supported wiring as permitted in Part II of Article 396</p> <p><u>(4) As service entrance conductors</u></p> <p>(B) Underground Service-Entrance Cable. Type USE cable shall not be used under the following conditions or in the following locations:</p> <p>(1) For interior wiring</p> <p>(2) For aboveground installations except where USE cable emerges from the ground and is terminated in an enclosure at an outdoor location and the cable is protected in accordance with 300.5(D)</p> <p>(3) As aerial cable unless it is a multiconductor cable identified for use aboveground and installed as messenger-supported wiring in accordance with 225.10 and Part II of Article 396</p> <p><u>(4) As service entrance conductors</u></p>	
(S) and (N) [W]	358.10	Uses Permitted	<p>358.10 Uses Permitted.</p> <p>(A) Exposed and Concealed. The use of EMT shall be permitted for both exposed and concealed work for the following:</p> <p>(1) In concrete ((,)) not in direct contact with the earth ((or in))</p> <p>(2) In areas not subject to severe corrosive influences ((where installed in accordance with 358.10(B))</p> <p>(2)) (3) In dry, damp, and wet locations</p> <p>((3)) (4) In any hazardous (classified) location as permitted by other articles in this Code</p> <p>(B) Corrosive Environments.</p> <p>(1) Galvanized Steel and Stainless Steel EMT, Elbows, and Fittings. Galvanized steel and stainless steel EMT, elbows, and fittings shall be permitted to be installed in concrete ((,)) <u>that is not</u> in direct contact with the earth ((,)) or in areas <u>not</u> subject to severe corrosive influences where protected by corrosion protection and approved as suitable for the condition.</p> <p>(2) Supplementary Protection of Aluminum EMT. Aluminum EMT shall be provided with approved supplementary corrosion protection where encased in concrete ((or)) when the concrete is not in direct contact with the earth.</p>	<p>358.10 Uses Permitted.</p> <p>(A) Exposed and Concealed. The use of EMT shall be permitted for both exposed and concealed work for the following:</p> <p>(1) In concrete((,)) not in direct contact with the earth((, in direct burial applications with fittings identified for direct burial, or in areas subject to ((severe)) corrosive influences where installed in accordance with 358.10(B).)))</p> <p>(2) In dry, damp, and wet locations</p> <p>(3) In any hazardous (classified) location as permitted by other articles in this Code</p> <p>(4) For manufactured wiring systems as permitted in 604.100(A)(2)</p> <p>(B) Corrosive Environments.</p> <p>(1) Galvanized Steel and Stainless Steel EMT, Elbows, and Fittings. Galvanized steel and stainless steel EMT, elbows, and fittings shall be permitted to be installed in concrete((,)) <u>that is not</u> in direct contact with the earth, or in areas subject to ((severe)) corrosive influences where protected by corrosion protection and approved as suitable for the condition.</p> <p>(2) Supplementary Protection of Aluminum EMT. Aluminum EMT shall be provided with approved supplementary corrosion protection where encased in concrete or in direct contact with the earth.</p>	SDCI recommends striking new 2023 NEC language allowing the use of EMT in direct burial applications and where severe corrosive influences exist. The sections within the article have been renumbered to align with NEC.

			<p>(((C)) Cinder Fill. Galvanized steel and stainless steel EMT shall be permitted to be installed in cinder concrete or cinder fill where subject to permanent moisture when protected on all sides by a layer of noncinder concrete at least 50 mm (2 in.) thick or when the tubing is installed at least 450 mm (18 in.) under the fill.</p> <p>(D)) (C) Wet Locations. All supports, bolts, straps, screws, and so forth shall be of corrosion-resistant materials or protected against corrosion by corrosion-resistant materials.</p> <p><u>Circuits installed in EMT in wet locations shall use equipment grounding conductors sized in accordance with Section 250.122.</u></p> <p>Informational Note: See 300.6 for protection against corrosion.</p> <p>(((E))) (D) Physical Damage. Steel and stainless steel EMT shall be permitted to be installed where subject to physical damage.</p>	<p>(C) Cinder Fill. Galvanized steel and stainless steel EMT shall be permitted to be installed in cinder concrete or cinder fill where subject to permanent moisture when protected on all sides by a layer of noncinder concrete at least 50 mm (2 in.) thick or when the tubing is installed at least 450 mm (18 in.) under the fill.</p> <p>(D) Wet Locations. All supports, bolts, straps, screws, and so forth shall be of corrosion-resistant materials or protected against corrosion by corrosion-resistant materials.</p> <p><u>Circuits installed in EMT in wet locations shall use equipment grounding conductors sized in accordance with Section 250.122.</u></p> <p>Informational Note: See 300.6 for protection against corrosion. Informational Note: The requirements of 296-46B-358-012(2) ARE INCORPORATED HEREIN.</p> <p>(E) Physical Damage. Steel and stainless steel EMT shall be permitted to be installed where subject to physical damage.</p>	
S	358.12	Uses Not Permitted	<p>358.12 Uses Not Permitted. EMT shall not be used under the following conditions:</p> <p>(((1)) Where subject to severe physical damage)</p> <p>(((2)) For the support of luminaires or other equipment except conduit bodies no larger than the largest trade size of the tubing))</p> <p>(1) Where, during installation or afterward, it will be subject to severe physical damage.</p> <p>(2) Where protected from corrosion solely by enamel.</p> <p>(3) <u>In cinder concrete or finder fill where subject to permanent moisture unless protected on all sides by a layer of noncinder concrete at least 50 mm (2 in.) thick or unless the tubing is at least 450 mm (18 in.) under the fill.</u></p> <p>(4) <u>In any hazardous (classified) location except as permitted by other articles in this Code.</u></p> <p>(5) <u>For the support of luminaires or other equipment except conduit bodies no larger than the largest trade size of tubing.</u></p> <p>(6) <u>Where practicable, dissimilar metals in contact anywhere in the system shall be avoided to eliminate the possibility of galvanic action.</u></p> <p>(7) <u>Where placed in concrete and the concrete is in direct contact with the earth.</u></p> <p><i>Exception: Aluminum fittings and enclosures shall be permitted to be used in steel EMT where not subject to severe corrosive influences.</i></p>	<p>358.12 Uses Not Permitted. EMT shall not be used under the following conditions:</p> <p>(1) Where, <u>during or after installation, it is</u> subject to severe physical damage</p> <p>(2) For the support of luminaires or other equipment except conduit bodies no larger than the largest trade size of the tubing</p> <p><u>(3) Where protected from corrosion solely by enamel.</u></p> <p><u>(4) Where placed in concrete and the concrete is in direct contact with the earth.</u></p>	SDCI recommends striking items that are duplicated and also found in other portions of the code (See NEC 358.14). This article has also been renumbered to reflect the numbering in the original NEC section.
S	382	Nonmetallic Extensions	<p><u>Article 382 is not adopted.</u></p> <p>((Part I. General</p> <p>382.1 Scope. This article covers the use, installation, and construction specifications for nonmetallic extensions.</p> <p>382.2 Definitions. The definitions in this section shall apply within this article and throughout the Code.</p>	<p><u>Article 382 Nonmetallic Extensions is not adopted.</u></p>	No change, but SDCI won't showing the full text of the section being struck in the Quick Reference document published by SDCI. Less future editing.

		<p>A Concealable Nonmetallic Extension. A listed assembly of two, three, or four insulated circuit conductors within a nonmetallic jacket, an extruded thermoplastic covering, or a sealed nonmetallic covering. The classification includes surface extensions intended for mounting directly on the surface of walls or ceilings and concealed with paint, texture, joint compound, plaster, wallpaper, tile, wall paneling, or other similar materials.</p> <p>Nonmetallic Extension. An assembly of two insulated conductors within a nonmetallic jacket or an extruded thermoplastic covering. The classification includes surface extensions intended for mounting directly on the surface of walls or ceilings.</p> <p>382.6 Listing Requirements. Concealable nonmetallic extensions and associated fittings and devices shall be listed. The starting/source tap device for the extension shall contain and provide the following protection for all load-side extensions and devices:</p> <ol style="list-style-type: none"> (1) Supplementary overcurrent protection (2) Level of protection equivalent to a Class A GFCI (3) Level of protection equivalent to a portable GFCI (4) Line and load-side miswire protection (5) Provide protection from the effects of arc faults <p>Part II. Installation</p> <p>382.10 Uses Permitted. Nonmetallic extensions shall be permitted only in accordance with 382.10(A), (B), and (C).</p> <p>(A) From an Existing Outlet. The extension shall be from an existing outlet on a 15- or 20-ampere branch circuit. Where a concealable nonmetallic extension originates from a non-grounding type receptacle, the installation shall comply with 250.130(C), 406.4(D)(2)(b), or 406.4(D)(2)(c).</p> <p>(B) Exposed and in a Dry Location. The extension shall be run exposed, or concealed as permitted in 382.15, and in a dry location.</p> <p>(C) Residential or Offices. For nonmetallic surface extensions mounted directly on the surface of walls or ceilings, the building shall be occupied for residential or office purposes and shall not exceed three floors abovegrade. Where identified for the use, concealable nonmetallic extensions shall be permitted more than three floors abovegrade.</p> <p>Informational Note No. 1: See 310.14(A)(3) for temperature limitation of conductors. Informational Note No. 2: See 362.10 for definition of First Floor.</p> <p>382.12 Uses Not Permitted. Nonmetallic extensions shall not be used as follows:</p> <ol style="list-style-type: none"> (1) In unfinished basements, attics, or roof spaces (2) Where the voltage between conductors exceeds 150 volts for nonmetallic surface extensions and 300 volts for aerial cable (3) Where subject to corrosive vapors 		
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(4) Where run through a floor or partition, or outside the room in which it originates

382.15 Exposed.

(A) Nonmetallic Extensions. One or more extensions shall be permitted to be run in any direction from an existing outlet, but not on the floor or within 50 mm (2 in.) from the floor.

(B) Concealable Nonmetallic Extensions. Where identified for the use, nonmetallic extensions shall be permitted to be concealed with paint, texture, concealing compound, plaster, wallpaper, tile, wall paneling, or other similar materials and installed in accordance with 382.15(A).

382.26 Bends.

(A) Nonmetallic Extensions. A bend that reduces the normal spacing between the conductors shall be covered with a cap to protect the assembly from physical damage.

(B) Concealable Nonmetallic Extensions. Concealable extensions shall be permitted to be folded back over themselves and flattened as required for installation.

382.30 Securing and Supporting.

(A) Nonmetallic Extensions. Nonmetallic surface extensions shall be secured in place by approved means at intervals not exceeding 200 mm (8 in.), with an allowance for 300 mm (12 in.) to the first fastening where the connection to the supplying outlet is by means of an attachment plug. There shall be at least one fastening between each two adjacent outlets supplied. An extension shall be attached to only woodwork or plaster finish and shall not be in contact with any metal work or other conductive material other than with metal plates on receptacles.

(B) Concealable Nonmetallic Extensions. All surface mounted concealable nonmetallic extension components shall be firmly anchored to the wall or ceiling using an adhesive or mechanical anchoring system identified for this use.

382.40 Boxes and Fittings. Each run shall terminate in a fitting, connector, or box that covers the end of the assembly. All fittings, connectors, and devices shall be of a type identified for the use.

382.42 Devices.

(A) Receptacles. All receptacles, receptacle housings, and self-contained devices used with concealable nonmetallic extensions shall be identified for this use.

(B) Receptacles and Housings. Receptacle housings and self-contained devices designed either for surface or for recessed mounting shall be permitted for use with concealable nonmetallic extensions. Receptacle housings and self-contained devices shall incorporate means for facilitating entry and termination of concealable nonmetallic extensions and for electrically connecting the housing or device. Receptacle and self-contained devices shall comply with 406.4. Power and communications outlets installed together in common housing shall be permitted in accordance with 805.133(A)(1)(e), Exception No. 2.

382.56 Splices and Taps. Extensions shall consist of a continuous unbroken length of the assembly, without splices, and without exposed conductors between fittings, connectors, or devices. Taps shall be permitted where approved fittings completely covering the tap connections are used. Aerial cable and its tap connectors shall be provided with an approved means for polarization. Receptacle type tap connectors shall be of the locking type.

			<p>382.100 Construction. Concealable nonmetallic extensions shall be of a multilayer flat conductor design consisting of a center ungrounded conductor enclosed by a sectioned grounded conductor and an overall sectioned equipment grounding conductor.</p> <p>382.104 Flat Conductors. Concealable nonmetallic extensions shall be constructed, using flat copper conductors equivalent to 14 AWG or 12 AWG conductor sizes, and constructed per 382.104(A), (B), and (C).</p>		
S	394.56	Splices and taps	<p>394.56 Splices and Taps. Splices shall be soldered unless approved splicing devices are used. In-line or strain splices shall not be used.</p>	<p>394.56 Splices and Taps. Splices shall be soldered unless approved splicing devices are used. In-line or strain splices shall not be used.</p> <p><u>Informational note. To determine if splices and taps are required to be protected with boxes, conduit bodies or fittings see 300.14.</u></p>	<p>New informational note with a pointer to requirements for boxes, conduit bodies, or fittings. They aren't required in all installations. May need editing.</p>
S	398	Open Wiring on Insulators	<p>Article 398 is not adopted.</p> <p>((Part I. General</p> <p>398.1 Scope. This article covers the use, installation, and construction specifications of open wiring on insulators.</p> <p>398.2 Definition. The definition in this section shall apply within this article and throughout the Code.</p> <p>Open Wiring on Insulators. An exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings.</p> <p>Part II. Installation</p> <p>398.10 Uses Permitted. Open wiring on insulators shall be permitted only for industrial or agricultural establishments on systems of 600 volts, nominal, or less, as follows:</p> <p>(1) Indoors or outdoors (2) In wet or dry locations</p> <p>(3) Where subject to corrosive vapors (4) For services</p> <p>398.12 Uses Not Permitted. Open wiring on insulators shall not be installed where concealed by the building structure.</p> <p>398.15 Exposed Work.</p> <p>(A) Dry Locations. In dry locations, where not exposed to physical damage, conductors shall be permitted to be separately enclosed in flexible nonmetallic tubing. The tubing shall be in continuous lengths not exceeding 4.5 m (15 ft) and secured to the surface by straps at intervals not exceeding 1.4 m (4 1/2 ft).</p> <p>(B) Entering Spaces Subject to Dampness, Wetness, or Corrosive Vapors. Conductors entering or leaving locations subject to dampness, wetness, or corrosive vapors shall have drip loops formed on them and shall then pass upward and inward from the outside of the buildings, or from the damp, wet, or corrosive location, through noncombustible, nonabsorbent insulating tubes.</p> <p>Informational Note: See 230.52 for individual conductors entering buildings or other structures.</p> <p>(C) Exposed to Physical Damage. Conductors within 2.1 m (7 ft) from the floor shall be considered exposed to physical damage. Where open conductors cross ceiling joists and wall studs and are exposed to physical damage, they shall be protected by one of the following methods:</p> <p>(1) Guard strips not less than 25 mm (1 in.) nominal in thickness and at least as high as the insulating supports, placed on each side of and close to the wiring.</p> <p>(2) A substantial running board at least 13 mm (1/2 in.) thick in back of the conductors with side protections. Running boards shall extend at least 25 mm (1 in.) outside the conductors, but not more than 50 mm (2 in.), and the protecting sides shall be at least 50 mm (2 in.) high and at least 25 mm (1 in.), nominal, in thickness.</p>	<p>Article 398 Open Wiring on Insulators is not adopted.</p>	<p>No change. SDCI will not include the full text of Article 398 in quick reference document for 2023 SEC. Delete code section and simply state that Article 398 not adopted (less future editing).</p>

		<p>(3) — Boxing made in accordance with 398.15(C)(1) or (C)(2) and furnished with a cover kept at least 25 mm (1 in.) away from the conductors within. Where protecting vertical conductors on side walls, the boxing shall be closed at the top and the holes through which the conductors pass shall be bushed.</p> <p>(4) — Rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing. When installed in metal piping, the conductors shall be encased in continuous lengths of approved flexible tubing.</p> <p>398.17 Through or Parallel to Framing Members. Open conductors shall be separated from contact with walls, floors, wood cross members, or partitions through which they pass by tubes or bushings of noncombustible, nonabsorbent insulating material. Where the bushing is shorter than the hole, a waterproof sleeve of noninductive material shall be inserted in the hole and an insulating bushing slipped into the sleeve at each end in such a manner as to keep the conductors absolutely out of contact with the sleeve. Each conductor shall be carried through a separate tube or sleeve.</p> <p>Informational Note: See 310.15(A)(3) for temperature limitation of conductors.</p> <p>398.19 Clearances. Open conductors shall be separated at least 50 mm (2 in.) from metal raceways, piping, or other conducting material, and from any exposed lighting, power, or signaling conductor, or shall be separated therefrom by a continuous and firmly fixed nonconductor in addition to the insulation of the conductor. Where any insulating tube is used, it shall be secured at the ends. Where practicable, conductors shall pass over rather than under any piping subject to leakage or accumulations of moisture.</p> <p>398.23 In Accessible Attics. Conductors in unfinished attics and roof spaces shall comply with 398.23(A) or (B).</p> <p>(A) — Accessible by Stairway or Permanent Ladder. Conductor shall be installed along the side of or through bored holes in floor joists, studs, or rafters. Where run through bored holes, conductors in the joists and in studs or rafters to a height of not less than 2.1 m (7 ft) above the floor or floor joists shall be protected by substantial running boards extending not less than 25 mm (1 in.) on each side of the conductors. Running boards shall be securely fastened in place. Running boards and guard strips shall not be required for conductors installed along the sides of joists, studs, or rafters.</p> <p>(B) — Not Accessible by Stairway or Permanent Ladder. Conductors shall be installed along the sides of or through bored holes in floor joists, studs, or rafters. Exception: In buildings completed before the wiring is installed, in attic and roof spaces that are not accessible by stairway or permanent ladder and have headroom at all points less than 900 mm (3 ft), the wiring shall be permitted to be installed on the edges of rafters or joists facing the attic or roof space.</p> <p>398.30 Securing and Supporting.</p> <p>(A) — Conductor Sizes Smaller Than 8 AWG. Conductors smaller than 8 AWG shall be rigidly supported on noncombustible, nonabsorbent insulating materials and shall not contact any other objects. Supports shall be installed as follows:</p> <ol style="list-style-type: none"> (1) — Within 150 mm (6 in.) from a tap or splice (2) — Within 300 mm (12 in.) of a dead-end connection to a lampholder or receptacle (3) — At intervals not exceeding 1.4 m (4 1/2 ft) and at closer intervals sufficient to provide adequate support where likely to be disturbed <p>(B) — Conductor Sizes 8 AWG and Larger. Supports for conductors 8 AWG or larger installed across open spaces shall be permitted up to 4.5 m (15 ft) apart if noncombustible, nonabsorbent insulating spacers are used at least every 1.4 m (4 1/2 ft) to maintain at least 65 mm (2 1/2 in.) between conductors. Where not likely to be disturbed in buildings of mill construction, 8 AWG and larger conductors shall be permitted to be run across open spaces if supported from</p>		
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		<p>each wood cross member on approved insulators maintaining 150 mm (6 in.) between conductors.</p> <p>(C) — Industrial Establishments. In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the system, conductors of sizes 250 kcmil and larger shall be permitted to be run across open spaces where supported at intervals up to 9.0 m (30 ft) apart.</p> <p>(D) — Mounting of Conductor Supports. Where nails are used to mount knobs, they shall not be smaller than tenpenny. Where screws are used to mount knobs, or where nails or screws are used to mount cleats, they shall be of a length sufficient to penetrate the wood to a depth equal to at least one-half the height of the knob and the full thickness of the cleat. Cushion washers shall be used with nails.</p> <p>(E) — Tie Wires. Conductors 8 AWG or larger and supported on solid knobs shall be securely tied thereto by tie wires having an insulation equivalent to that of the conductor.</p> <p>398.42 Devices. Surface type snap switches shall be mounted in accordance with 404.10(A), and boxes shall not be required. Other type switches shall be installed in accordance with 404.4.</p> <p>Part III. Construction Specifications.</p> <p>398.104 Conductors. Conductors shall be of a type specified by Article 310.)</p>		
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Article 400 Equipment for General Use

S	404.3	Enclosure	<p>404.3 Enclosure.</p> <p>(A) General. Switches and circuit breakers shall be of the externally operable type mounted in an enclosure listed for the intended use. The minimum wire-bending space at terminals and minimum gutter space provided in switch enclosures shall be as required in 312.6.</p> <p><i>((Exception No. 1: Pendant and surface type snap switches and knife switches mounted on an open face switchboard or panelboard shall be permitted without enclosures.</i></p> <p><i>Exception No. 2: Switches and circuit breakers installed in accordance with 110.27(A)(1), (A)(2), (A)(3), or (A)(4) shall be permitted without enclosures.))</i></p> <p>(B) Used as a Raceway. Enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless the enclosure complies with 312.8.</p>	<p>404.3 Enclosure.</p> <p>(A) General. Switches and circuit breakers shall be of the externally operable type mounted in an enclosure listed for the intended use. The minimum wire-bending space at terminals and minimum gutter space provided in switch enclosures shall be as required in 312.6.</p> <p><i>((Exception No. 1: Pendant and surface type snap switches and knife switches mounted on an open face switchboard or panelboard shall be permitted without enclosures.</i></p> <p><i>Exception No. 2: Switches and circuit breakers installed in accordance with 110.27(A)(1), (A)(2), (A)(3), or (A)(4) shall be permitted without enclosures.))</i></p> <p>(B) Used as a Raceway. Enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless the enclosure complies with 312.8.</p>	<p>It makes sense to not allow open switches since all have to be in enclosures which are bonded for Ground Faults.</p> <p>No changes from 2020 code. Carry over 2020 amendments (strike exceptions) and overlay onto 2023 NEC language.</p>
S	404.10	Mounting of General-Use Snap Switches, Dimmers, and Control Switches.	<p>404.10 Mounting of General-Use Snap Switches, Dimmers, and Control Switches.</p> <p>(A) Surface Type. General use snap switches, dimmers, and control switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least 13 mm (1/2 in.) from the surface wired over.)) Reserved.</p> <p>(B) Box Mounted. Flush-type general-use snap switches, dimmers, and control switches mounted in boxes that are set back of the finished surface as permitted in 314.20 shall be installed so that the extension plaster ears are seated against the surface. Flush-type devices mounted in boxes that are flush with the finished surface or project from it shall be installed so that the mounting yoke or strap of the device is seated against the box. Screws used for</p>	<p>404.10 Mounting of General-Use Snap Switches, Dimmers, and Control Switches.</p> <p>(A) Surface Type. General use snap switches, dimmers, and control switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least 13 mm (1/2 in.) from the surface wired over. <u>Reserved.</u></p> <p>(B) Box Mounted. Flush-type general-use snap switches, dimmers, and control switches mounted in boxes that are set back of the finished surface as permitted in 314.20 shall be installed so that the extension plaster ears are seated against the surface. Flush-type devices mounted in boxes that are flush with the finished surface or project from it shall be installed so that the mounting yoke or strap of the device is seated against the box. Screws used for the purpose of attaching a device to a box shall be of the type provided with a listed device, or shall be machine screws having 32</p>	<p>Continue to strike the allowance to use open devices without enclosure. Strike only allows surface device in an enclosure.</p> <p>No changes from 2020 code. Carry over 2020 amendment (strike (A) Surface type and overlay onto 2023 NEC language.</p>

			the purpose of attaching a device to a box shall be of the type provided with a listed device, or shall be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions.	threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions.	
S	404.13	Knife Switches.	<p>404.13 Knife Switches.</p> <p>(A) Isolating Switches. Knife switches rated at over 1200 amperes at 250 volts or less, and at over 1000 amperes at 251 to 1000 volts, shall be used only as isolating switches and shall not be opened under load.</p> <p>(B) To Interrupt Currents. To interrupt currents over 1200 amperes at 250 volts, nominal, or less, or over 600 amperes at 251 to 1000 volts, nominal, a circuit breaker or a switch listed for such purpose shall be used.</p> <p>(C) General-Use Switches. Knife switches of ratings less than specified in 404.13(A) and (B) shall be considered general-use switches.</p> <p>Informational Note: See the definition of General-Use Switch in Article 100.</p> <p>(D) Motor-Circuit Switches. Motor-circuit switches shall be permitted to be of the knife-switch type.</p> <p>Informational Note: See the definition of a <i>Motor-Circuit Switch</i> in Article 100.</p> <p>(E) Interlocking. All switches shall be <u>interlocking type to prevent the door from being opened when the switch is in the ON position. All switches used as service disconnecting means and those rated over 300 volts shall be of the two- way interlocking type.</u></p> <p>For the purpose of this provision, "two-way interlocking" means that the <u>door is prevented from being opened when the switch is ON and prevents the switch from being turned ON when the door is open.</u></p>	<p>404.13 Knife Switches.</p> <p>(A) Isolating Switches. Knife switches rated at over 1200 amperes at 250 volts or less, and at over 1000 amperes at 251 to 1000 volts, shall be used only as isolating switches and shall not be opened under load.</p> <p>(B) To Interrupt Currents. To interrupt currents over 1200 amperes at 250 volts, nominal, or less, or over 600 amperes at 251 to 1000 volts, nominal, a circuit breaker or a switch listed for such purpose shall be used.</p> <p>(C) General-Use Switches. Knife switches of ratings less than specified in <u>404.13(A)</u> and (B) shall be considered general-use switches.</p> <p>Informational Note: See Article 100 for the definition of <i>general-use switch</i>.</p> <p>(D) Motor-Circuit Switches. Motor-circuit switches shall be permitted to be of the knife-switch type.</p> <p>Informational Note: See Article 100 for the definition of <i>motor-circuit switch</i>.</p> <p>(E) Interlocking. All switches shall be <u>interlocking type to prevent the door from being opened when the switch is in the ON position. All switches used as service disconnecting means and those rated over 300 volts shall be of the two- way interlocking type.</u></p> <p>For the purpose of this provision, "two-way interlocking" means that the door is <u>prevented from being opened when the switch is ON and prevents the switch from being turned ON when the door is open.</u></p>	<p>Keep the amendment requiring double interlock for safety switches added as (E).</p> <p>Carry over 2020 amendments and overlay on 2023 NEC amendment.</p>
S	406.9 (C)	Bathtub and shower space		<p>(C) Bathtub and Shower Space.</p> <p>Receptacles shall not be installed inside of the tub or shower or within a zone measured 900 mm (3 ft) horizontally from any outside edge of the bathtub or shower stall, including the space outside the bathtub or shower stall space below the zone.</p> <p>?????Need language for this....</p> <p>The zone also includes the space measured vertically from the floor to 2.5 m (8 ft) above the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space directly over the bathtub or shower stall and the space below this zone, but not the space separated by a floor, wall, ceiling, room door, window, or fixed barrier.</p> <p>Exception No. 1: Receptacles installed in accordance with <u>680.73</u> shall be permitted.</p> <p>Exception No. 2:</p>	<p>Oh hold! Undefined showers with floor drain—whole bathroom. How do we deal with them? Add new paragraph after 2nd paragraph. WR (weather-resistant receptacle) cover? May want to add...Don't mention bubble covers.</p>

				<p><i>In bathrooms with less than the required zone, the receptacle(s) required by 210.52(D) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.</i></p> <p><i>Exception No. 3:</i> <i>Weight supporting ceiling receptacles (WSCR) shall be permitted to be installed for listed luminaires that employ a weight supporting attachment fitting (WSAF) in damp locations complying with 410.10(D).</i></p> <p><i>Exception No. 4:</i> <i>In a dwelling unit, a single receptacle shall be permitted for an electronic toilet or personal hygiene device such as an electronic bidet seat. The receptacle shall be readily accessible and not located in the space between the toilet and the bathtub or shower.</i></p> <p><i>Informational Note No. 1:</i> <i>See 210.8(A)(1) for GFCI requirements in a bathroom.</i></p> <p><i>Informational Note No. 2:</i> <i>See 210.11(C) for bathroom branch circuits.</i></p> <p><i>Informational Note No. 3:</i> <i>See 210.21(B)(1) for single receptacle on an individual branch.</i></p>	
W	410.10	Luminaires in Specific Locations	<p>410.10 Luminaires in Specific Locations.</p> <p>(A) Wet and Damp Locations. Luminaires installed in wet or damp locations shall be installed such that water cannot enter or accumulate in wiring compartments, lampholders, or other electrical parts. All luminaires installed in wet locations shall be marked, “Suitable for Wet Locations.” All luminaires installed in damp locations shall be marked “Suitable for Wet Locations” or “Suitable for Damp Locations.”</p> <p>(B) Corrosive Locations. Luminaires installed in corrosive locations shall be of a type suitable for such locations.</p> <p>(C) In Ducts or Hoods. Luminaires shall be permitted to be installed in commercial cooking hoods where all of the following conditions are met:</p> <ol style="list-style-type: none"> (1) The luminaire shall be identified for use within commercial cooking hoods and installed such that the temperature limits of the materials used are not exceeded. (2) The luminaire shall be constructed so that all exhaust vapors, grease, oil, or cooking vapors are excluded from the lamp and wiring compartment. Diffusers shall be resistant to thermal shock. (3) Parts of the luminaire exposed within the hood shall be corrosion resistant or protected against corrosion, and the surface shall be smooth so as not to collect deposits and to facilitate cleaning. (4) Wiring methods and materials supplying the luminaire(s) shall not be exposed within the cooking hood. <p>Informational Note: See 110.11 for conductors and equipment exposed to deteriorating agents.</p> <p>(D) Bathtub and Shower Areas. A luminaire installed in a bathtub or shower area shall meet all of the following requirements:</p>	<p>410.10 Luminaires in Specific Locations.</p> <p>(A) Wet and Damp Locations. Luminaires installed in wet or damp locations shall be installed such that water cannot enter or accumulate in wiring compartments, lampholders, or other electrical parts. All luminaires installed in wet locations shall be marked as suitable for wet locations. All luminaires installed in damp locations shall be marked as suitable for wet locations or suitable for damp locations.</p> <p>(B) Corrosive Locations. Luminaires installed in corrosive locations shall be of a type suitable for such locations.</p> <p>(C) In Ducts or Hoods. Luminaires shall be permitted to be installed in commercial cooking hoods where all of the following conditions are met:</p> <ol style="list-style-type: none"> (1) The luminaire shall be identified for use within commercial cooking hoods and installed such that the temperature limits of the materials used are not exceeded. (2) The luminaire shall be constructed so that all exhaust vapors, grease, oil, or cooking vapors are excluded from the lamp and wiring compartment. Diffusers shall be resistant to thermal shock. (3) Parts of the luminaire exposed within the hood shall be corrosion resistant or protected against corrosion, and the surface shall be smooth so as not to collect deposits and to facilitate cleaning. (4) Wiring methods and materials supplying the luminaire(s) shall not be exposed within the cooking hood. <p>Informational Note: See 110.11 for conductors and equipment exposed to deteriorating agents.</p>	<p>Same as 2020, changed per the state code to require light fixtures in shower areas which are conductive to be GFCI protected.</p> <p>Keep strike out of 900 mm (3 ft) Keep 2020 amendment. Add new language to (D)(2)</p>

		<p>N (1) No parts of cord-connected luminaires, chain-, cable-, or cord-suspended luminaires, lighting track, pendants, or ceiling-suspended (paddle) fans shall be located within a zone measured (900 mm (3 ft)) 1.5 M (5 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower stall threshold. This zone is all-encompassing and includes the space directly over the tub or shower stall.</p> <p>N (2) Luminaires located within the actual outside dimension of the bathtub or shower to a height of 2.5 m (8 ft) vertically from the top of the bathtub rim or shower threshold shall be marked suitable for damp locations or marked suitable for wet locations. Luminaires located where subject to shower spray shall be marked suitable for wet locations. <u>Luminaires, with exposed metal parts that are grounded, must be ground fault circuit interrupter protected.</u></p> <p><small>Informational Note: WAC 296-46B-410 requirements for protective equipment are incorporated herein with edits.</small></p> <p>(E) Luminaires in Indoor Sports, Mixed-Use, and All-Purpose Facilities. Luminaires subject to physical damage, using a mercury vapor or metal halide lamp, installed in playing and spectator seating areas of indoor sports, mixed-use, or all-purpose facilities shall be of the type that protects the lamp with a glass or plastic lens. Such luminaires shall be permitted to have an additional guard.</p> <p>(F) Luminaires Installed in or Under Roof Decking. Luminaires installed in exposed or concealed locations under metal-corrugated sheet roof decking shall be installed and supported so there is not less than 38 mm (1 1/2 in.) measured from the lowest surface of the roof decking to the top of the luminaire.</p>	<p>(D) Bathtub and Shower Areas. A luminaire installed in a bathtub or shower area shall meet all of the following requirements:</p> <p>(1) No parts of cord-connected luminaires, chain-, cable-, or cord-suspended luminaires, lighting track, pendants, or ceiling-suspended (paddle) fans with luminaire (light kit) shall be located within a zone measured (900 mm (3 ft)) 1.5 M (5 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower stall threshold. This zone is all-encompassing and includes the space directly over the tub or shower stall.</p> <p>(2) Luminaires located within the actual outside dimension of the bathtub or shower to a height of 2.5 m (8 ft) vertically from the top of the bathtub rim or shower threshold or within 5 feet of the waterline shall be marked suitable for damp locations or marked suitable for wet locations. Luminaires located where subject to shower spray shall be marked suitable for wet locations. <u>Luminaires, with exposed metal parts that are grounded, must be ground fault circuit interrupter protected.</u></p> <p><small>Informational Note: WAC 296-46B-410 requirements for protective equipment are incorporated herein with edits.</small></p> <p>(E) Luminaires in Indoor Sports, Mixed-Use, and All-Purpose Facilities. Luminaires subject to physical damage, using a mercury vapor or metal halide lamp, installed in playing and spectator seating areas of indoor sports, mixed-use, or all-purpose facilities shall be of the type that protects the lamp with a glass or plastic lens. Such luminaires shall be permitted to have an additional guard.</p> <p>(F) Luminaires Installed in or Under Roof Decking. Luminaires installed in exposed or concealed locations under roof decking where subject to physical damage shall be installed and supported so there is not less than 38 mm (1 1/2 in.) measured from the lowest surface of the roof decking to the top of the luminaire.</p> <p><i>Exception: The 38 mm (1 1/2 in.) spacing is not required where metal-corrugated sheet roof decking is covered with a minimum thickness 50 mm (2 in.) concrete slab, measured from the top of the corrugated roofing.</i></p>	
S	440.14	<p>Location</p> <p>440.14 Location. Disconnecting means shall be located within sight from, and readily accessible from the air- conditioning or refrigerating equipment. The disconnecting means shall be permitted to be installed on or within the air-conditioning or refrigerating equipment.</p> <p>The disconnecting means shall not be located on panels that are designed to allow access to the air-conditioning or refrigeration equipment or to obscure the equipment nameplate(s).</p> <p><i>Exception No. 1: Where the disconnecting means provided in accordance with 430.102(A) is lockable in accordance with 110.25 and the refrigerating or air-conditioning equipment is essential to an industrial process in a facility with written safety procedures, and where the conditions of maintenance and supervision ensure that only qualified persons service the equipment, a disconnecting means within sight from the equipment shall not be required.</i></p> <p><i>Exception No. 2: Where an attachment plug and receptacle serve as the disconnecting means in accordance with 440.13, their location shall be accessible but shall not be required to be readily accessible.</i></p>	<p>440.14 Location. Disconnecting means shall be located within sight from, and readily accessible from, the air-conditioning or refrigerating equipment. The disconnecting means shall be permitted to be installed on or within the air-conditioning or refrigerating equipment. Disconnecting means shall meet the working space requirements of 110.26(A).</p> <p>The disconnecting means shall not be located on panels that are designed to allow access to the air-conditioning or refrigeration equipment or where it obscures the equipment nameplate(s).</p> <p><i>Exception No. 1: Where the disconnecting means provided in accordance with 430.102(A) is lockable in accordance with 110.25 and the refrigerating or air-conditioning equipment is essential to an industrial process in a facility with written safety procedures, and where the conditions of maintenance and supervision ensure that only qualified persons service the equipment, a disconnecting means within sight from the equipment shall not be required.</i></p> <p><i>Exception No. 2: Where an attachment plug and receptacle serve as the disconnecting means in accordance with 440.13, their location shall be accessible but shall not be required to be readily accessible.</i></p>	<p>Per 440.8, Chris Jensen of UL, the s/plit system is listed as a complete unit with both the compressor outside and heads inside. 430.81(A) is referenced and if the motor is less than 1/8hp then the breaker can suffice as the disconnect. 430.112 exception is also referenced which allows one disconnect for several motors in a related system.</p> <p>In multifamily, some of the new installations, there is a compressor on the house panel serving up to 8 individual units. In this case, the head is served from the unit's panel and the breaker would suffice as the disconnect for the head per 430.81(A) (unless someone objects)</p> <p>The code change is an allowance to not have to provide a disconnect for the head of the split system. Is this statement needed? (Exception 3)</p> <p>Keep exception 3 and add new sentence.</p>

			<p><u>Exception 3: In dwelling units, a disconnecting means is required for the indoor unit(s) of a split system HVAC/R system, unless the outside unit's disconnecting means is lockable and disconnects the indoor unit, and an indoor disconnecting means is not required by the manufacturer.</u></p> <p>Informational Note No. 1: See Parts VII and IX of Article 430 for additional requirements.</p> <p>Informational Note No. 2: See 110.26.</p>	<p><u>Exception 3: In dwelling units, a disconnecting means is required for the indoor unit(s) of a split system HVAC/R system, unless the outside unit's disconnecting means is lockable and disconnects the indoor unit, and an indoor disconnecting means is not required by the manufacturer. In dwelling units, if an indoor unit is served from a separate circuit than the exterior unit, the disconnecting means shall be within sight of the unit, or be capable of being locked in the open position in compliance with 110.25.</u></p> <p>Informational Note: See Parts VII and IX of Article <u>430</u> for additional requirements.</p>	
S	450.9	Ventilation	<p>450.9 Ventilation. The ventilation shall dispose of the transformer full-load heat losses without creating a temperature rise that is in excess of the transformer rating.</p> <p>Informational Note No. 1: See IEEE C57.12.00-2015, <i>General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers</i>, and IEEE C57.12.01-2015, <i>General Requirements for Dry-Type Distribution and Power Transformers</i>.</p> <p>Informational Note No. 2: Additional losses occur in some transformers where nonsinusoidal currents are present, resulting in increased heat in the transformer above its rating. See IEEE C57.110-2008, <i>Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents</i>, where transformers are utilized with nonlinear loads.</p> <p>Informational Note No. 3: See <i>Seattle Building Code</i> Chapter 4, <i>Special Detailed Requirements Based on Use and Occupancy</i>, for additional private and utility vault ventilation and other minimum construction requirements.</p> <p>Transformers with ventilating openings shall be installed so that the ventilating openings are not blocked by walls or other obstructions. The required clearances shall be clearly marked on the transformer. Transformer top surfaces that are horizontal and readily accessible shall be marked to prohibit storage.</p>	<p>450.9 Ventilation. The ventilation shall dispose of the transformer full-load heat losses without creating a temperature rise that is in excess of the transformer rating.</p> <p>Informational Note No. 1: See IEEE C57.12.00-2015, <i>General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers</i>, and IEEE C57.12.01-2020, <i>General Requirements for Dry-Type Distribution and Power Transformers</i>, for additional information.</p> <p>Informational Note No. 2: See IEEE C57.110-2018, <i>Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents</i>, for more information where transformers are used with nonlinear loads that have nonsinusoidal currents that can result in additional losses and transformer heating.</p> <p>Informational Note No. 3: See <i>Seattle Building Code</i> Chapter 4, <i>Special Detailed Requirements Based on Use and Occupancy</i>, for additional private and utility vault ventilation and other minimum construction requirements.</p> <p>Transformers with ventilating openings shall be installed so that the ventilating openings are not blocked by walls or other obstructions. The required clearances shall be clearly marked on the transformer. Transformer top surfaces that are horizontal and readily accessible shall be marked to prohibit storage.</p>	<p>Points the contractor to Seattle City Light (SCL) for SCL's requirements for the transformer vault inside the building.</p> <p>Keep 2020 amendments, overlay on 2024 NEC. Keep informational note #3.</p>
S	450.19	Location of Pad-Mounted Transformers	<p>450.19 Location of Pad-Mounted Transformers. To determine the approved location of pad-mounted transformers, see <i>Seattle Building Code</i> Chapter 4, <i>Special Detailed Requirements Based on Use and Occupancy</i>, for private and utility vault minimum standards.</p>	<p>450.19 Location of Pad-Mounted Transformers. To determine the approved location of pad-mounted transformers, see <i>Seattle Building Code</i> Chapter 4, <i>Special Detailed Requirements Based on Use and Occupancy</i>, for private and utility vault minimum standards.</p>	<p>This is Seattle only article identifying the location in the Seattle building code for location of a pad mount transformer.</p> <p>Keep 2020 amendment and overlay on 2023 NEC language.</p>
S	450.20	Rating of Dry-Type Transformers	<p>450.20 Rating of Dry-Type Transformers. Dry-type transformers shall be rated not less than the load served as determined in accordance with Article 220 of this Code.</p>	<p>450.20 Rating of Dry-Type Transformers. Dry-type transformers shall be rated not less than the load served as determined in accordance with Article 220 of this Code.</p>	<p>This is a Seattle-only issue. We don't want to overload a dry-type transformer. Nothing in the NEC defines overloading of a transformer, it talks only of the feeders, which typically are 125% over the size of the transformer.</p> <p>No change. Keep 2020 amendment and overlay on 2023 NEC language.</p>
S	450.26	Oil-Insulated Transformers Installed Indoors	<p>450.26 Oil-Insulated Transformers Installed Indoors. Oil-insulated transformers installed indoors shall be installed in a vault constructed as specified in (Part III of this article) Chapter 4 of the <i>Seattle Building Code</i>.</p> <p>((Exception No. 1: Where the total capacity does not exceed 112 1/2 kVA, the vault specified in Part III of this article shall be permitted to be constructed of reinforced concrete that is not less than 100 mm (4 in.) thick.))</p> <p>Exception No. ((2)) 1: Where the nominal voltage does not exceed 1,000, a vault shall not be required if suitable arrangements are made to prevent a transformer oil fire from igniting other materials and the total capacity in one location does not exceed 10 kVA in a section of the building classified as</p>	<p>450.26 Oil-Insulated Transformers Installed Indoors. Oil-insulated transformers installed indoors shall be installed in a vault constructed as specified in Part III of this article, Chapter 4 of the <i>Seattle Building Code</i>.</p> <p>Exception No. 1: Where the total capacity does not exceed 112 1/2 kVA, the vault specified in Part III of this article shall be permitted to be constructed of reinforced concrete that is not less than 100 mm (4 in.) thick.</p> <p>Exception No. 2: Where the nominal voltage does not exceed 1000, a vault shall not be required if suitable arrangements are made to prevent a transformer oil fire from igniting other materials and the total capacity in one location does not exceed 10 kVA</p>	<p>This article directs the installation per Chapter 4 of the SBC. Exception 1 is deleted and placed in reserve. Exception 1 was for larger transformers installed indoors. Exception 5 remains the same to direct to the SBC for detached buildings.</p> <p>No change. Keep 2020 amendment and overlay on 2023 NEC language. Renumber to match NEC.</p>

			<p>combustible or 75 kVA where the surrounding structure is classified as fire-resistant construction.</p> <p>Exception No. ((3)) 2: Electric furnace transformers that have a total rating not exceeding 75 kVA shall be permitted to be installed without a vault in a building or room of fire-resistant construction, provided suitable arrangements are made to prevent a transformer oil fire from spreading to other combustible material.</p> <p>Exception No. ((4)) 3: A transformer that has a total rating not exceeding 75 kVA and a supply voltage of 1,000 volts or less that is an integral part of charged-particle-accelerating equipment shall be permitted to be installed without a vault in a building or room of noncombustible or fire-resistant construction, provided suitable arrangements are made to prevent a transformer oil fire from spreading to other combustible material.</p> <p>Exception No. ((5)) 4: Transformers shall be permitted to be installed in a detached building that does not comply with ((Part III of this article)) Chapter 4 of the Seattle Building Code if neither the building nor its contents present a fire hazard to any other building or property, and if the building is used only in supplying electric service and the interior is accessible only to qualified persons.</p> <p>((Exception No. 6: Oil-insulated transformers shall be permitted to be used without a vault in portable and mobile surface mining equipment (such as electric excavators) if each of the following conditions is met:</p> <p>(1) Provision is made for draining leaking fluid to the ground. (2) Provision is made for draining leaking fluid to the ground. (3) A minimum 6 mm (1/4 in.) steel barrier is provided for personnel protection.))</p>	<p>in a section of the building classified as combustible or 75 kVA where the surrounding structure is classified as fire-resistant construction.</p> <p>Exception No. 3: Electric furnace transformers that have a total rating not exceeding 75 kVA shall be permitted to be installed without a vault in a building or room of fire-resistant construction, provided suitable arrangements are made to prevent a transformer oil fire from spreading to other combustible material.</p> <p>Exception No. 4: A transformer that has a total rating not exceeding 75 kVA and a supply voltage of 1000 volts or less that is an integral part of charged-particle-accelerating equipment shall be permitted to be installed without a vault in a building or room of noncombustible or fire-resistant construction, provided suitable arrangements are made to prevent a transformer oil fire from spreading to other combustible material.</p> <p>Exception No. 5: Transformers shall be permitted to be installed in a detached building that does not comply with Part III of this article Chapter 4 of the Seattle Building Code if neither the building nor its contents present a fire hazard to any other building or property, and if the building is used only in supplying electric service and the interior is accessible only to qualified persons.</p> <p>((Exception No. 6: Oil-insulated transformers shall be permitted to be used without a vault in portable and mobile surface mining equipment (such as electric excavators) if each of the following conditions is met:</p> <p>(1) Provision is made for draining leaking fluid to the ground. (2) Safe egress is provided for personnel. (3) A minimum 6 mm (1/4 in.) steel barrier is provided for personnel protection.))</p>	
W	450.27	Oil-Insulated Transformers Installed Outdoors.	<p>450.27 Oil-Insulated Transformers Installed Outdoors. ((Combustible material, combustible buildings, and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires originating in oil-insulated transformers installed on roofs, attached to or adjacent to a building or combustible material.</p> <p>In cases where the transformer installation presents a fire hazard, one or more of the following safeguards shall be applied according to the degree of hazard involved:</p> <p>(1) Space separations (2) Fire-resistant barriers (3) Automatic fire suppression systems (4) Enclosures that confine the oil of a ruptured transformer tank</p> <p>Oil enclosures shall be permitted to consist of fire-resistant dikes, curbed areas or basins, or trenches filled with coarse, crushed stone. Oil enclosures shall be provided with trapped drains where the exposure and the quantity of oil involved are such that removal of oil is important.</p> <p>Informational Note: For additional information on transformers installed on poles or structures or underground, see ANSI/IEEE C2-2017, National Electrical Safety Code.))</p> <p>(A) Requirements. Oil-insulated transformers installed outdoors shall meet the following requirements:</p> <p>(1) A transformer installed adjacent to a building or structure having a combustible surface shall be located no closer than 2.4 m (8 ft) to the building or structure and shall be outside a line extended vertically from the ends of the eaves or rooflines as</p>	<p>450.27 Oil-Insulated Transformers Installed Outdoors. ((Combustible material, combustible buildings, and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires originating in oil-insulated transformers installed on roofs, attached to or adjacent to a building or combustible material.</p> <p>In cases where the transformer installation presents a fire hazard, one or more of the following safeguards shall be applied according to the degree of hazard involved:</p> <p>(1) Space separations (2) Fire-resistant barriers (3) Automatic fire suppression systems (4) Enclosures that confine the oil of a ruptured transformer tank</p> <p>Oil enclosures shall be permitted to consist of fire-resistant dikes, curbed areas or basins, or trenches filled with coarse, crushed stone. Oil enclosures shall be provided with trapped drains where the exposure and the quantity of oil involved are such that removal of oil is important.</p> <p>Informational Note: See ANSI/IEEE C2-2017, National Electrical Safety Code, for additional information on transformers installed on poles or structures or underground.</p> <p>(A) Requirements. Oil-insulated transformers installed outdoors shall meet the following requirements:</p> <p>(1) A transformer installed adjacent to a building or structure having any combustible surface shall be located no closer than 2.4 m (8 ft) to the building or structure and shall be outside a line extended</p>	<p>This revision for oil filled transformers is for both pad mount and underground transformer vaults. This is the same as the 2020 SEC with minor modifications including requiring an engineer to determine the height of the containment sill.</p> <p>In #3 remove the word “unprotected window” for just any “window”. (What is a protected window?)</p> <p>Carry over 2020 SEC amendments and overlay on 2023 NEC language.</p>

illustrated in the shaded “Approved Transformer Area” shown in Figure 450-1;

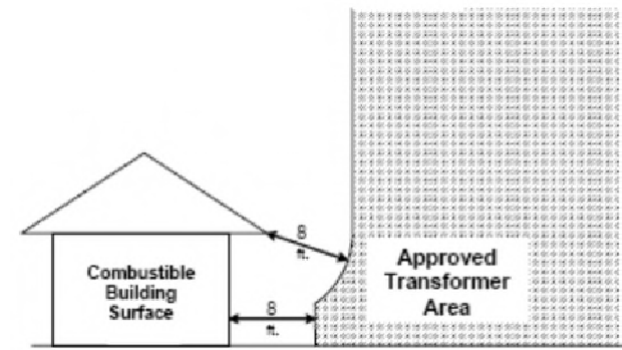


Figure 450-1

- (2) A transformer installed adjacent to a building or structure with no combustibile surface shall be located no closer than 610 mm (2 ft) to the building or structure and shall be outside a line extended vertically from the ends of the eaves or rooflines as illustrated in the shaded “Approved Transformer Area” shown in Figure 450-2.

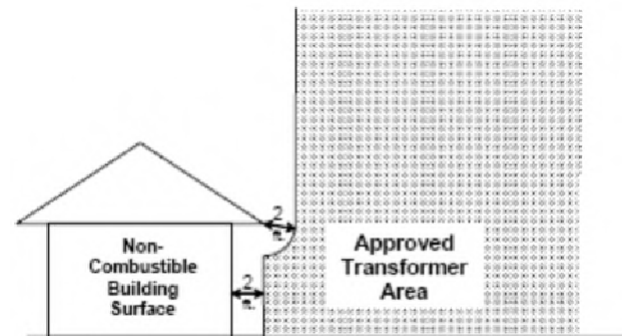


Figure 450-2

- (3) A building or structure shall have no doorway, unprotected window, stairway, or other openings closer than 3.0 m (10 ft) to the transformer;
- (4) The finished grade at the location of the transformer shall have a containment sill such that any oil leaking from a transformer will be contained. The containment sill shall be as high as necessary to contain the oil of one transformer but in no case less than 100 mm (4 in.) high.
- (5) If transformers are installed in areas subject to traffic other than pedestrian traffic, they shall be provided with adequate guarding.

(B) Locations. Openings in enclosures for total underground oil-filled transformers shall be located no closer than 3.0 m (10 ft) of a doorway, operable window, stairway or fire escape. Adequate space must be maintained above the enclosure so that a boom may be used to lift the transformer from the enclosure.

vertically from the ends of the eaves or rooflines as illustrated in the shaded “Approved Transformer Area” shown in Figure 450-1;

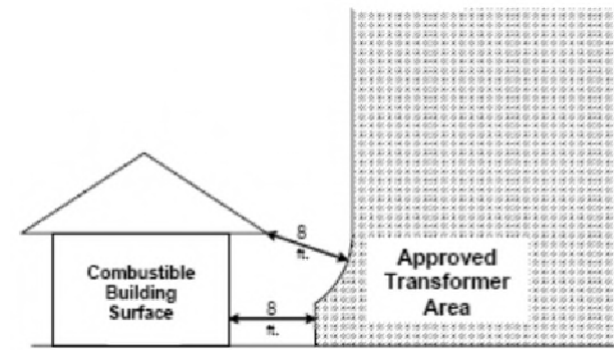


Figure 450-1

- (2) A transformer installed adjacent to a building or structure with no combustibile surface(s) shall be located no closer than 610 mm (2 ft) to the building or structure and shall be outside a line extended vertically from the ends of the eaves or rooflines as illustrated in the shaded “Approved Transformer Area” shown in Figure 450-2.

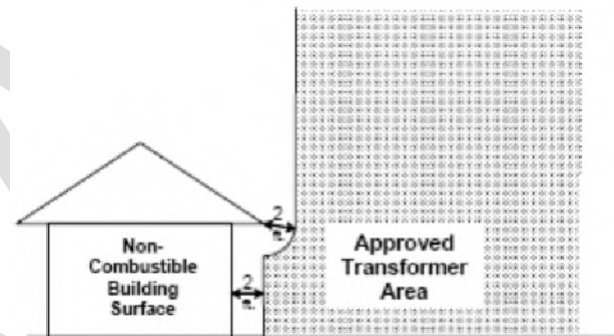


Figure 450-2

- (3) A building or structure shall have no doorway, ~~unprotected~~ window, stairway, or other openings closer than 3.0 m (10 ft) to the transformer;
- (4) The finished grade at the location of the transformer shall have a containment sill such that any oil leaking from a transformer will be contained. The containment sill shall be as high as necessary to contain the oil of one transformer as determined by a professional engineer but in no case less than 100 mm (4 in.) high.
- (5) If transformers are installed in areas subject to traffic other than pedestrian traffic, they shall be provided with adequate guarding.

(B) Locations. Openings in enclosures for total underground oil-filled transformers shall be located no closer than 3.0 m (10 ft) of a doorway, operable window, stairway or fire escape. Adequate space must be maintained above the enclosure so that a boom may be used to lift the transformer from the enclosure.

Informational Note: WAC 296-46B-450 Equipment for general use – Transformers and transformer vaults. 027 flammable-liquid or oil-filled transformers installed outdoors is incorporated herein with modifications.

S	Part III.	Transformer Vaults	<p>Part III. Transformer Vaults</p> <p>Sections 450.41 through 450.48 are not adopted. See Chapter 4 of the <i>Seattle Building Code</i> for transformer vault requirements.</p>	<p>Part III. Transformer Vaults</p> <p>Sections 450.41 through 450.48 are not adopted. See Chapter 4 of the <i>Seattle Building Code</i> for transformer vault requirements.</p>	<p>Because SBC has the vault requirements, this article is not adopted.</p> <p>Keep 2020 SEC amendment as shown.</p>
S	450.42		<p>450.42 Walls, Roofs, and Floors. The walls and roofs of vaults shall be constructed of materials that have approved structural strength for the conditions with a minimum fire resistance of 3 hours. The floors of vaults in contact with the earth shall be of concrete that is not less than 100 mm (4 in.) thick, but, where the vault is constructed with a vacant space or other stories below it, the floor shall have approved structural strength for the load imposed thereon and a minimum fire resistance of 3 hours. For the purposes of this section, studs and wallboard construction shall not be permitted.</p> <p><i>Exception: Where transformers are protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.</i></p> <p>Informational Note No. 1: For additional information, see ASTM E119-18a, <i>Methods for Fire Tests of Building Construction and Materials</i>.</p> <p>Informational Note No. 2: A typical 3-hour construction is 150 mm (6 in.) thick reinforced concrete.</p>	<p>(450.42 Walls, Roofs, and Floors. The walls and roofs of vaults shall be constructed of materials that have approved structural strength for the conditions with a minimum fire resistance of 3 hours. The floors of vaults in contact with the earth shall be of concrete that is not less than 100 mm (4 in.) thick, but, where the vault is constructed with a vacant space or other stories below it, the floor shall have approved structural strength for the load imposed thereon and a minimum fire resistance of 3 hours. For the purposes of this section, studs and wallboard construction shall not be permitted.</p> <p><i>Exception:</i> <i>Where transformers are protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.</i></p> <p>Informational Note No. 1: See ASTM E119-20, <i>Standard Test Methods for Fire Tests of Building Construction and Materials</i>, for additional information.</p> <p>Informational Note No. 2: A typical 3-hour construction is 150 mm (6 in.) thick reinforced concrete.)</p>	<p>Keep 2020 strike out of section and overlay onto 2023 NEC code language. Construction of vaults is covered in the building code.</p>
S	450.43	Doorways	<p>450.43 Doorways. Vault doorways shall be protected in accordance with 450.43(A), (B), and (C).</p> <p>(A) Type of Door. Each doorway leading into a vault from the building interior shall be provided with a tight-fitting door that has a minimum fire rating of 3 hours. The authority having jurisdiction shall be permitted to require such a door for an exterior wall opening where conditions warrant.</p> <p><i>Exception: Where transformers are protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.</i></p> <p>Informational Note: For additional information, see NFPA 80-2016, <i>Standard for Fire Doors and Other Opening Protectives</i>.</p> <p>(B) Sills. A door sill or curb that is of an approved height that will confine the oil from the largest transformer within the vault shall be provided, and in no case shall the height be less than 100 mm (4 in.).</p> <p>(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.</p>	<p>450.43 Doorways. Vault doorways shall be protected in accordance with 450.43(A), (B), and (C).</p> <p>(A) Type of Door. Each doorway leading into a vault from the building interior shall be provided with a tight-fitting door that has a minimum fire rating of 3 hours. The authority having jurisdiction shall be permitted to require such a door for an exterior wall opening where conditions warrant.</p> <p><i>Exception: Where transformers are protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.</i></p> <p>Informational Note: For additional information, see NFPA 80-2016, <i>Standard for Fire Doors and Other Opening Protectives</i>.</p> <p>(B) Sills. A door sill or curb that is of an approved height that will confine the oil from the largest transformer within the vault shall be provided, and in no case shall the height be less than 100 mm (4 in.).</p> <p>(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.</p>	<p>Strike through (A), (B), and (C). This was missed last code cycle. Vaults are covered in chapter 4 of the SBC Private vaults are covered in Section 430 of the building code. This is not needed here.</p> <p>Strike entire 2023 NEC section.</p>
S	450.45	Ventilation Openings	<p>450.45 Ventilation Openings. Where required by 450.9, openings for ventilation shall be provided in accordance with 450.45(A) through (F).</p> <p>(A) Location. Ventilation openings shall be located as far as possible from doors, windows, fire escapes, and combustible material.</p> <p>(B) Arrangement. A vault ventilated by natural circulation of air shall be permitted to have roughly half of the total area of openings required for ventilation in one or more openings near the floor and the remainder in one or more openings in the roof or in the sidewalls near the roof, or all of the area required for ventilation shall be permitted in one or more openings in or near the roof.</p>	<p>450.45 Ventilation Openings. Where required by 450.9, openings for ventilation shall be provided in accordance with 450.45(A) through (F).</p> <p>(A) Location. Ventilation openings shall be located as far as possible from doors, windows, fire escapes, and combustible material.</p> <p>(B) Arrangement. A vault ventilated by natural circulation of air shall be permitted to have roughly half of the total area of openings required for ventilation in one or more openings near the floor and the remainder in one or more openings in the roof or in the sidewalls near the roof, or all of the area required for ventilation shall be permitted in one or more openings in or near the roof.</p>	<p>No change. Carry over 2020 strikeout of section and overlay onto 2023 NEC code language.</p>

			<p>(C) Size. For a vault ventilated by natural circulation of air to an outdoor area, the combined net area of all ventilating openings, after deducting the area occupied by screens, gratings, or louvers, shall not be less than 1900 mm² (3 in.²) per kVA of transformer capacity in service, and in no case shall the net area be less than 0.1 m² (1 ft²) for any capacity under 50 kVA.</p> <p>(D) Covering. Ventilation openings shall be covered with durable gratings, screens, or louvers, according to the treatment required in order to avoid unsafe conditions.</p> <p>(E) Dampers. All ventilation openings to the indoors shall be provided with automatic closing fire dampers that operate in response to a vault fire. Such dampers shall possess a standard fire rating of not less than 1 1/2 hours.</p> <p style="text-align: center;">Informational Note: See ANSI/UL 555-2016, Standard for Fire Dampers.</p> <p>(F) Ducts. Ventilating ducts shall be constructed of fire resistant material.</p>	<p>(C) Size. For a vault ventilated by natural circulation of air to an outdoor area, the combined net area of all ventilating openings, after deducting the area occupied by screens, gratings, or louvers, shall not be less than 1900 mm² (3 in.²) per kVA of transformer capacity in service, and in no case shall the net area be less than 0.1 m² (1 ft²) for any capacity under 50 kVA.</p> <p>(D) Covering. Ventilation openings shall be covered with durable gratings, screens, or louvers, according to the treatment required in order to avoid unsafe conditions.</p> <p>(E) Dampers. All ventilation openings to the indoors shall be provided with automatic closing fire dampers that operate in response to a vault fire. Such dampers shall possess a standard fire rating of not less than 1 1/2 hours.</p> <p style="text-align: center;">Informational Note: See ANSI/UL 555-2016, Standard for Fire Dampers.</p> <p>(F) Ducts. Ventilating ducts shall be constructed of fire resistant material.</p>	
S	450.46	Drainage	<p>450.46 Drainage. Where practicable, vaults containing more than 100 kVA transformer capacity shall be provided with a drain or other means that will carry off any accumulation of oil or water in the vault unless local conditions make this impracticable. The floor shall be pitched to the drain where provided.</p>	<p>450.46 Drainage. Where practicable, vaults containing more than 100 kVA transformer capacity shall be provided with a drain or other means that will carry off any accumulation of oil or water in the vault unless local conditions make this impracticable. The floor shall be pitched to the drain where provided.</p>	No change. Carry over 2020 strikeout of section and overlay onto 2023 NEC code language.
S	450.47	Water Pipes and Accessories	<p>450.47 Water Pipes and Accessories. Any pipe or duct system foreign to the electrical installation shall not enter or pass through a transformer vault. Piping or other facilities provided for vault fire protection, or for transformer cooling, shall not be considered foreign to the electrical installation.</p>	<p>450.47 Water Pipes and Accessories. Any pipe or duct system foreign to the electrical installation shall not enter or pass through a transformer vault. Piping or other facilities provided for vault fire protection, or for transformer cooling, shall not be considered foreign to the electrical installation.</p>	No change. Carry over 2020 strikeout of section and overlay onto 2023 NEC code language.
S	450.48	Storage in Vaults	<p>450.48 Storage in Vaults. Materials shall not be stored in transformer vaults.)</p>	<p>450.48 Storage in Vaults. Materials shall not be stored in transformer vaults.</p>	No change. Carry over 2020 strikeout of section and overlay onto 2023 NEC code language.

Article 500 Special Occupancies

S	500.5		<p>500.5 Classifications of Locations</p> <p>Δ (A) General. Locations shall be classified depending on the properties of the flammable gas, flammable liquid– produced vapor, combustible liquid– produced vapors, combustible dusts, or fibers/flyings that could be present, and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section, or area shall be considered individually in determining its classification. Where pyrophoric materials are the only materials used or handled, these locations are outside the scope of this article.</p> <p>Informational Note: Through the exercise of ingenuity in the layout of electrical installations for hazardous (classified) locations, it is frequently possible to locate much of the equipment in a reduced level of classification or in an unclassified location and, thus, to reduce the amount of special equipment required.</p> <p>Refrigerant machinery rooms that contain ammonia refrigeration systems and are equipped with adequate mechanical ventilation that operates continuously or is initiated by a detection system at a concentration not exceeding 150 ppm shall be permitted to be classified as “unclassified” locations.</p> <p>Informational Note: For further information regarding classification and ventilation of areas involving closed-circuit ammonia refrigeration systems, see ANSI/IIAR 2-2014, <i>Standard for Safe Design of Closed-Circuit Ammonia Refrigeration Systems</i>.</p>	<p>500.5 Classifications of Locations.</p> <p>(A) General.</p> <p>(1) Hazardous (Classified) Locations. Locations shall be classified depending on the properties of the flammable gas, flammable liquid–produced vapor, combustible liquid–produced vapors, combustible dusts, or fibers/flyings that could be present, and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section, or area shall be considered individually in determining its classification.</p> <p style="text-align: center;">Informational Note: Through the exercise of ingenuity in the layout of electrical installations for hazardous (classified) locations, it is frequently possible to locate much of the equipment in a reduced level of classification or in an unclassified location to reduce the amount of special equipment required.</p> <p>(2) Refrigerant Machinery Rooms Using Ammonia. Refrigerant machinery rooms that contain ammonia refrigeration systems and are equipped with adequate mechanical ventilation that operates continuously or is initiated by a detection system at a concentration not exceeding 150 ppm shall be permitted to be classified as “unclassified” locations.</p> <p style="text-align: center;">Informational Note: See ANSI/IIAR 2, <i>Standard for Design of Safe Closed-Circuit Ammonia Refrigeration Systems</i>, for information on classification and ventilation of areas involving closed-circuit ammonia refrigeration systems.</p>	Two informational notes have been combined into one note. 500.5 (B) (4), exception to (4) was combined into the informational note after (B) (3) that lists locations that are usually considered Class I, Division 1. We recommend not adopting (striking) 500.5(B)(1)(4) and adopting WAC 501.2.
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(B) Class I Locations. Class I locations are those in which flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations shall include those specified in 500.5(B)(1) and (B)(2).

(1) **Class I, Division 1.** A Class I, Division 1 location is a location:

- (1) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors can exist under normal operating conditions, or
- (2) In which ignitable concentrations of such flammable gases, flammable liquid-produced vapors, or combustible liquids above their flash points may exist frequently because of repair or maintenance operations or because of leakage, or
- (3) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors and might also cause simultaneous failure of electrical equipment in such a way as to directly cause the electrical equipment to become a source of ignition
- (4) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors can exist under normal operating conditions in a below grade sump(s) installed in a parking garage(s) and directly cause the electrical sump pump equipment to become a source of ignition.

Exception to (4): The parking garage location may be considered unclassified when an engineer, licensed by the State of Washington, provides sufficient documentation that is stamped and signed by the engineer.

Informational Note No. 1: This classification usually includes the following locations:

- (1) Where volatile flammable liquids or liquefied flammable gases are transferred from one container to another
- (2) Interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used
- (3) Locations containing open tanks or vats of volatile flammable liquids
- (4) Drying rooms or compartments for the evaporation of flammable solvents
- (5) Locations containing fat- and oil-extraction equipment using volatile flammable solvent
- (6) Portions of cleaning and dyeing plants where flammable liquids are used
- (7) Gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape
- (8) Inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids
- (9) The interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers
- (10) All other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations

Informational Note No. 2: In some Division 1 locations, ignitable concentrations of flammable gases or vapors may be present continuously or for long periods of time. Examples include the following:

- (1) The inside of inadequately vented enclosures containing instruments normally venting flammable gases or vapors to the interior of the enclosure
- (2) The inside of vented tanks containing volatile flammable liquids
- (3) The area between the inner and outer roof sections of a floating roof tank containing volatile flammable fluids

(B) Class I Locations.

Class I locations are those in which flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations shall include those specified in 500.5(B)(1) and (B)(2).

(1) Class I, Division 1.

A Class I, Division 1 location is a location:

- (1) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors can exist under normal operating conditions, or
- (2) In which ignitable concentrations of such flammable gases, flammable liquid-produced vapors, or combustible liquids above their flash points might exist frequently because of repair or maintenance operations or because of leakage, or
- (3) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors and might also cause simultaneous failure of electrical equipment in such a way as to directly cause the electrical equipment to become a source of ignition

~~(4) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors can exist under normal operating conditions in a below grade sump(s) installed in a parking garage(s) and directly cause the electrical sump pump equipment to become a source of ignition.~~

~~Exception to (4): The parking garage location may be considered unclassified when an engineer, licensed by the State of Washington, provides sufficient documentation that is stamped and signed by the engineer.~~

Informational Note: This classification usually includes the following locations:

- (1) Where volatile flammable liquids or liquefied flammable gases are transferred from one container to another
- (2) Interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used
- (3) Locations containing open tanks or vats of volatile flammable liquids
- (4) Drying rooms or compartments for the evaporation of flammable solvents
- (5) Locations containing fat- and oil-extraction equipment using volatile flammable solvents
- (6) Portions of cleaning and dyeing plants where flammable liquids are used
- (7) Gas generator rooms and other portions of gas manufacturing plants where flammable gas might escape
- (8) Inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids
- (9) Interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers
- (10) Inside of inadequately vented enclosures containing instruments normally venting flammable gases or vapors to the interior of the enclosure
- (11) Inside of vented tanks containing volatile flammable liquids
- (12) Area between inner and outer roof sections of floating roof tanks containing volatile flammable fluids
- (13) Inadequately ventilated areas within spraying or coating operations using volatile flammable fluids
- (14) Interior of exhaust ducts used to vent ignitable concentrations of gases or vapors

			<p>(4) Inadequately ventilated areas within spraying or coating operations using volatile flammable fluids</p> <p>(5) The interior of an exhaust duct that is used to vent ignitable concentrations of gases or vapors</p> <p>Experience has demonstrated the prudence of avoiding the installation of instrumentation or other electrical equipment in these particular areas altogether or where it cannot be avoided because it is essential to the process and other locations are not feasible [see 500.5(A), Informational Note] using electrical equipment or instrumentation approved for the specific application or consisting of intrinsically safe systems as described in Article 504.</p>	<p>(15) All other locations where ignitable concentrations of flammable vapors or gases are likely to occur during normal operations</p> <p>Experience has demonstrated the prudence of avoiding the installation of instrumentation or other electrical equipment in the areas covered in list items (11) through (15). Where it cannot be avoided because it is essential to the process and other locations are not feasible, electrical equipment or instrumentation approved for the specific application or consisting of intrinsically safe systems might be considered.</p>	
W	501.2	Sewage disposal systems	No amendments	<p>501.2 Sewage Disposal Systems.</p> <p><u>(A) Pumping chambers for sewage, effluent, or grinder pumps in on-site and septic tank effluent pump (S.T.E.P.) disposal systems will be considered unclassified when not more than five residential units are connected to the system, residential units are connected to a utility sewage system, or when nonresidential systems have residential loading characteristics and all of the following general installations requirements are complied with:</u></p> <p><u>(1) The pumping chamber must be adequately vented. Venting may be accomplished through the building or structure plumbing vents where the system venting has been approved by the local jurisdiction authority or by a direct two-inch minimum vent to the atmosphere;</u></p> <p><u>(2) Equipment that in normal operation may cause an arc or spark must not be installed in any pumping chamber;</u></p> <p><u>(3) Float switches installed in a pumping chamber must be hermetically sealed to prevent the entrance of gases or vapors;</u></p> <p><u>(4) Junction boxes, conduits and fittings installed in the septic atmosphere must be of a noncorrosive type, installed to prevent the entrance of gases or vapors;</u></p> <p><u>(5) Where a conduit system is installed between the pumping chamber and the control panel, motor disconnect, or power source, an approved sealing method must be installed to prevent the migration of gases or vapors from the pumping chamber, and must remain accessible; and</u></p> <p><u>(6) Wire splices in junction boxes installed in pumping chambers must be suitable for wet locations.</u></p> <p><u>(B) Residential wastewater loading characteristics in a nonresidential installation:</u></p> <p><u>(1) For systems that process less than three thousand five hundred gallons of wastewater per day may be certified by:</u></p> <p><u>(a) An on-site wastewater designer licensed under chapter 18.210 RCW; or</u></p> <p><u>(b) A professional engineer, engaged in the business of on-site wastewater system design, licensed under chapter 18.43 RCW.</u></p> <p><u>(2) For systems that process three thousand five hundred gallons or more of wastewater per day may be certified by a professional engineer, engaged in the business of on-site wastewater system design, licensed under chapter 18.43 RCW. Written documentation must be signed and stamped by the designer or engineer and provided to the electrical inspector prior to inspection.</u></p> <p><u>(C) Any residential or nonresidential system that has building or structure floor drains being discharged into the system is classified as Class I Division 1. Drains from any commercially made tub, shower, basin, sink, or toilet are not considered floor drains.</u></p>	<p>This is regarding defining different pump systems and classifications. We reference this section in the WAC when doing inspections. We recommend putting it in the 2023 SEC.</p> <p>Adding language from 2023 WAC to 2023 SEC to correlate the two codes on this subject.</p>

				<p><u>(D) Pumping chamber access covers can be covered by gravel, light aggregate, or noncohesive granulated soil, and must be accessible for excavation. Access covers that are buried must have their exact location identified at the Page 33 of 118 WAC 296-46B-505 Class I, Zone 0, 1, and 2 Locations. electrical panel or other prominent location by an identification plate. The authority having jurisdiction for performing electrical inspections must approve the identification plate location.</u></p> <p><u>(E) Indoor grinder pumps installed in chambers with less than fifty gallons capacity are not required to meet the requirements of this section, except for the venting requirements in subsection (1)(a) of this section. Indoor grinder pumps installed in chambers with less than fifty gallons capacity are not classified systems as described in Article 500 NEC.</u></p> <p><u>(F) Secondary treatment effluent pumping chambers such as sand filters are unclassified, and require no special wiring methods.</u></p> <p><u>(G) Inspection approval is required prior to covering or concealing any portion of the septic electrical system, including the pump. New septic and effluent tanks containing electrical wires and equipment must be inspected and approved prior to being loaded with sewage.</u></p> <p><u>(H) On-site sewage disposal systems using pumps must have audible and visual alarms designed to alert the resident of a malfunction. The alarm must be placed on a circuit independent of the pump circuit.</u></p> <p><u>Informational Note: WAC 296-46B-501 001 Special occupancies – NEC Class I locations are incorporated herein.</u></p>	
W	505.7	Implementati on of Zone Classification.	No Seattle amendments.	<p>505.7 Special Precaution. This article requires equipment construction and installation that ensures safe performance under conditions of proper use and maintenance.</p> <p>Informational Note No. 1: It is important that inspection authorities and users exercise more than ordinary care regarding the installation and maintenance of electrical equipment in hazardous (classified) locations.</p> <p>Informational Note No. 2: Electrical equipment that is dependent on the protection technique permitted by 505.8(A) might not be suitable for use at temperatures lower than -20°C (-4°F) unless they are identified for use at lower temperatures. Low ambient conditions require special consideration. At low ambient temperatures, flammable concentrations of vapors might not exist in a location classified at normal ambient temperature.</p> <p>(A) Implementation of Zone Classification System. Classification of areas, engineering and design, selection of equipment and wiring methods, installation, and inspection shall be performed by qualified persons.</p> <p><u>For the purposes of NEC 505.7, a qualified person means professional engineer registered in Washington.</u></p> <p><u>Informational Note: WAC 296-46B-505 007 Implementation of Zone Classification</u></p> <p>(B) Dual Classification. In instances of areas within the same facility classified separately, Zone 2 locations shall be permitted to abut, but not overlap, Class I, Division 2 locations. Zone 0 or Zone 1 locations shall not abut Class I, Division 1 or Division 2 locations.</p>	Adding language from the WAC to correlate the Seattle Electrical Code with the 2023 State of WA Electrical code.

				<p>(C) Reclassification Permitted. A Class I, Division 1 or Division 2 location shall be permitted to be reclassified as a Zone 0, Zone 1, or Zone 2 location, provided all of the space that is classified because of a single flammable gas or vapor source is reclassified under the requirements of this article.</p> <p>(D) Solid Obstacles. Flameproof equipment with flanged joints shall not be installed such that the flange openings are closer than the distances shown in Table 505.7(D) to any solid obstacle that is not a part of the equipment (such as steelworks, walls, weather guards, mounting brackets, pipes, or other electrical equipment) unless the equipment is listed for a smaller distance of separation.</p> <p>Table 505.7(D) Minimum Distance of Obstructions from Flameproof “d” Flange Op</p> <table border="1"> <thead> <tr> <th rowspan="2">Gas Group</th> <th>Minimum Distance</th> </tr> <tr> <th>mm</th> </tr> </thead> <tbody> <tr> <td>IIC</td> <td>40</td> </tr> <tr> <td>IIB</td> <td>30</td> </tr> <tr> <td>IIA</td> <td>10</td> </tr> </tbody> </table> <p>(E) Simultaneous Presence of Flammable Gases and Combustible Dusts or Fibers/Flyings. Where flammable gases, combustible dusts, or fibers/flyings are or may be present at the same time, the simultaneous presence shall be considered during the selection and installation of the electrical equipment and the wiring methods, including the determination of the safe operating temperature of the electrical equipment.</p> <p>(F) Available Fault Current for Type of Protection “e”. Unless listed and marked for connection to circuits with higher available fault current, the available fault current for electrical equipment using type of protection “e” for the field wiring connections in Zone 1 locations shall be limited to 10,000 rms symmetrical amperes to reduce the likelihood of ignition of a flammable atmosphere by an arc during a short-circuit event.</p> <p>Informational Note: Limitation of the available fault current to this level may require the application of current-limiting fuses or current-limiting circuit breakers.</p>	Gas Group	Minimum Distance	mm	IIC	40	IIB	30	IIA	10	
Gas Group	Minimum Distance													
	mm													
IIC	40													
IIB	30													
IIA	10													
W	514.1	Motor Fuel Dispensing Facilities	No amendments	<p>514.1 Scope. This article shall apply to motor fuel dispensing facilities, marine/motor fuel dispensing facilities, <u>liquefied flammable gas storage or transfer facilities</u>, motor fuel dispensing facilities located inside buildings, and fleet vehicle motor fuel dispensing facilities.</p> <p><u>Informational Note 1: The requirements of WAC 296-46B-514 .001 are incorporated herein.</u></p> <p>Informational Note 2: See NFPA 30A-2021, <i>Code for Motor Fuel Dispensing Facilities and Repair Garages</i>, for information regarding safeguards for motor fuel dispensing facilities and for extracted text that is followed by a reference in brackets. Only editorial changes were made to the extracted text to make it consistent with this <i>Code</i>.</p>	Adding language from the WAC to correlate the Seattle Electrical Code with the 2023 State of WA Electrical code.									

W	514.3	Classification of Locations		<p>(C) Motor Fuel Dispensing Stations in Boatyards and Marinas. Informational Note: See NFPA 303, <i>Fire Protection Standard for Marinas and Boatyards</i>, and NFPA 30A, <i>Code for Motor Fuel Dispensing Facilities and Repair Garages</i>, for additional information.</p> <p>(1) General. Electrical wiring and equipment located at or serving motor fuel dispensing locations shall be installed on the side of the wharf, pier, or dock opposite from the liquid piping system.</p> <p>Δ(2) Classification of Class I, Division 1 and 2 Areas. The criteria provided in 514.3(C)(2)(a) and (C)(2)(b) shall be used for the purposes of applying Table 514.3(B)(1) and Table 514.3(B)(2) to motor fuel dispensing equipment on floating or fixed piers, wharfs, or docks.</p> <p>(a) <i>Closed Construction.</i> Where the construction of floating docks, piers, or wharfs is closed so that there is no space between the bottom of the dock, pier, or wharf and the water, as in the case of concrete-enclosed expanded foam or similar construction, and the construction includes integral service boxes with supply chases, the following shall apply:</p> <ol style="list-style-type: none"> (1) The space above the surface of the floating dock, pier, or wharf shall be a Class I, Division 2 location with distances in accordance with Table 514.3(B)(1) for dispenser and outdoor locations. (2) Spaces below the surface of the floating dock, pier, or wharf that have areas or enclosures, such as tubs, voids, pits, vaults, boxes, depressions, fuel piping chases, or similar spaces, where flammable liquid or vapor can accumulate shall be a Class I, Division 1 location. <p><i>(Exception No. 1:- Dock, pier, or wharf sections that do not support fuel dispensers and abut, but are located 6.0 m (20 ft) or more from, dock sections that support a fuel dispenser(s) shall be permitted to be Class I, Division 2 locations where documented air space is provided between dock sections to allow flammable liquids or vapors to dissipate without traveling to such dock sections. The documentation shall comply with the requirements of 500.4.</i></p> <p><i>Exception No. 2:- Dock, pier, or wharf sections that do not support fuel dispensers and do not directly abut sections that support fuel dispensers shall be permitted to be unclassified where documented air space is provided and where flammable liquids or vapors cannot travel to such dock sections. The documentation shall comply with the requirements</i></p> <p>Exception: Dock, pier, or wharf sections that do not support fuel dispensers and may abut a section(s) that supports a fuel dispenser(s) are permitted to be</p>	New language being incorporated from WAC 296-46B-415. Aligns 2023 with 2023 WAC.
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				<p><u>unclassified where documented air space between the sections is provided and where flammable liquids or vapors cannot travel to these sections. See NEC 500.4 for documentation requirements.</u></p>	
W	514.11	Circuit Disconnects		<p>514.11 ((Circuit Disconnects))<u>Emergency Disconnecting Means—Dispensing and service stations.</u></p> <p>Δ(A) Emergency Electrical Disconnects. (Fuel dispensing systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects shall be installed in approved locations but not less than 6 m (20 ft) or more than 30 m (100 ft) from the fuel dispensing devices that they serve. Emergency shutoff devices or electrical disconnects shall disconnect power to all dispensing devices; to all remote pumps serving the dispensing devices; to all associated power, control, and signal circuits; and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. When more than one emergency shutoff device or electrical disconnect is provided, all devices shall be interconnected. Resetting from an emergency shutoff condition shall require manual intervention and the manner of resetting shall be approved by the authority having jurisdiction. [30A:6.7] The emergency shutoff device shall disconnect simultaneously from the source of supply, all conductors of the circuits, including the grounded conductor, if any. Equipment grounding conductors shall remain connected.)</p> <p><u>An emergency disconnecting means or operator must be provided to disconnect the pump or dispensing equipment serving gasoline, volatile flammable liquids, or liquefied flammable gases. The emergency disconnecting means or operator must disconnect all conductors of the circuit supplying all station dispensers and/or pumps (including the grounded conductor) simultaneously from the source(s) of supply. The disconnecting means must be labeled with an identification plate, with letters at least 1 inch high, as the emergency disconnecting means. The disconnecting means or operator must be substantially red in color.</u></p> <p><i>Exception: Intrinsically safe systems shall not be required to meet this requirement.</i></p> <p>(B) Attended Self-Service Motor Fuel Dispensing Facilities. At attended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to the attendant. [30A:6.7.1]</p> <p>(C) Unattended Self-Service Motor Fuel Dispensing Facilities. At unattended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to patrons and at least one additional device or disconnect shall be readily accessible to each group of dispensing devices on an individual island. [30A:6.7.2]</p> <p><u>(D) Installations With Only One Dispensing Device. The emergency disconnecting means/operator may be used to satisfy subsection (3) of this section.</u></p> <p><u>(E) Multi circuit Installations. An electrically held normally open contactor operated by a push-button may serve as the disconnecting means to satisfy subsection (3) of this section. If a disconnecting pushbutton is used, the pushbutton may not function as the resetting mechanism for the electrically held contactor. The resetting means must be:</u></p> <ul style="list-style-type: none"> <u>(a) Located at least 15 feet or out of sight from the disconnecting pushbutton;</u> <u>(b) Installed behind a cover or guard; and</u> <u>(c) Identified with an identification plate that is substantially black in color.</u> 	<p>This change incorporates 296-46B-514 011 into the 2023 SEC. This is in the WAC but not in the SEC. SDCI references WAC on this for violations, now we would reference the SEC.</p>

				<p>Informational Note: WAC 296-46B-514 011 Emergency disconnecting means - Dispensing and service stations.</p>	
W	514.13			<p>514.13 Maintenance and Service of Dispensing Equipment. ((Each dispensing device shall be provided with a means to remove all external voltage sources, including power, communications, data, and video circuits and including feedback, during periods of maintenance and service of the dispensing equipment. The location of this means shall be permitted to be other than inside or adjacent to the dispensing device. The means shall be capable of being locked in the open position in accordance with 110.25.))</p> <p>The means to remove all external voltage sources for maintenance and service of dispensing equipment required by NEC 514.13 must be capable of isolating each dispenser individually from all external voltage sources including the grounded conductor, while all other dispensers remain operational.</p>	See WAC 296-46B-514. These changes correlate the language in the 2023 Seattle Electrical code with the 2023 WAC.
S	517.31	Requirements for the Essential Electrical System	<p>517.31 Requirements for the Essential Electrical System.</p> <p>Δ (A) Separate Branches. Type 1 essential electrical systems shall be comprised of three separate branches capable of supplying a limited amount of lighting and power service that is considered essential for life safety and effective hospital operation during the time the normal electrical service is interrupted for any reason. The three branches are life safety, critical, and equipment.</p> <p>The division between the branches shall occur at transfer switches where more than one transfer switch is required. [99:6.7.2.3.1]</p> <p>(B) Transfer Switches. Transfer switches shall be in accordance with one of the following:</p> <ol style="list-style-type: none"> (1) The number of transfer switches to be used shall be based on reliability and design. Each branch of the essential electrical system shall have one or more transfer switches. (2) One transfer switch shall be permitted to serve one or more branches in a facility with a continuous load on the switch of 150 kVA (120 kW) or less. [99:6.7.6.2.1.4] <p>Informational Note No. 1: See NFPA 99-2018, <i>Health Care Facilities Code</i>, 6.7.3.1, Transfer Switches; 6.7.2.2.5, Automatic Transfer Switch Features; 6.7.2.2.5.15, Nonautomatic Transfer Switch Features; and 6.7.2.2.7, Nonautomatic Transfer Device Features.</p> <p>Informational Note No. 2: See Informational Note Figure 517.31(a).</p> <p>Informational Note No. 3: See Informational Note Figure 517.31(b).</p> <p>(1) Optional Loads. Loads served by the generating equipment not specifically named in Article 517 shall be served by their own transfer switches such that the following conditions apply:</p> <ol style="list-style-type: none"> (1) These loads shall not be transferred if the transfer will overload the generating equipment. (2) These loads shall be automatically shed upon generating equipment overloading. 	<p>517.31 Requirements for the Essential Electrical System.</p> <p>(A) Separate Branches. Type 1 essential electrical systems shall be comprised of three separate branches capable of supplying a limited amount of lighting and power service that is considered essential for life safety and effective hospital operation during the time the normal electrical service is interrupted for any reason. The three branches are life safety, critical, and equipment.</p> <p>The division between the branches shall occur at transfer switches where more than one transfer switch is required. [99:6.7.2.3.1]</p> <p>(B) Transfer Switches. Transfer switches shall be in accordance with one of the following:</p> <ol style="list-style-type: none"> (1) The number of transfer switches to be used shall be based on reliability and design. Each branch of the essential electrical system shall have one or more transfer switches. (2) One transfer switch shall be permitted to serve one or more branches in a facility with a continuous load on the switch of 150 kVA (120 kW) or less. [99:6.7.6.2.1.4] <p>Informational Note No. 1: See NFPA 99-2021, <i>Health Care Facilities Code</i>, 6.7.3.1, 6.7.2.2.5, 6.7.2.2.5.15, and 6.7.2.2.7, for more information on transfer switches.</p> <p>Informational Note No. 2: See Informational Note Figure 517.31(B)(1).</p> <p>Informational Note No. 3: See Informational Note Figure 517.31(B)(2).</p>	Carry over 2020 Seattle amendment regarding selective coordination and overlay on 2023 NEC language.

(2) **Contiguous Facilities.** Hospital power sources and alternate power sources shall be permitted to serve the essential electrical systems of contiguous or same site facilities.

(C) **Wiring Requirements.**

Δ (1) **Separation from Other Circuits.** The life safety branch and critical branch [of the essential electrical system] shall be kept independent of all other wiring and equipment. [99: 6.7.5.2.1]

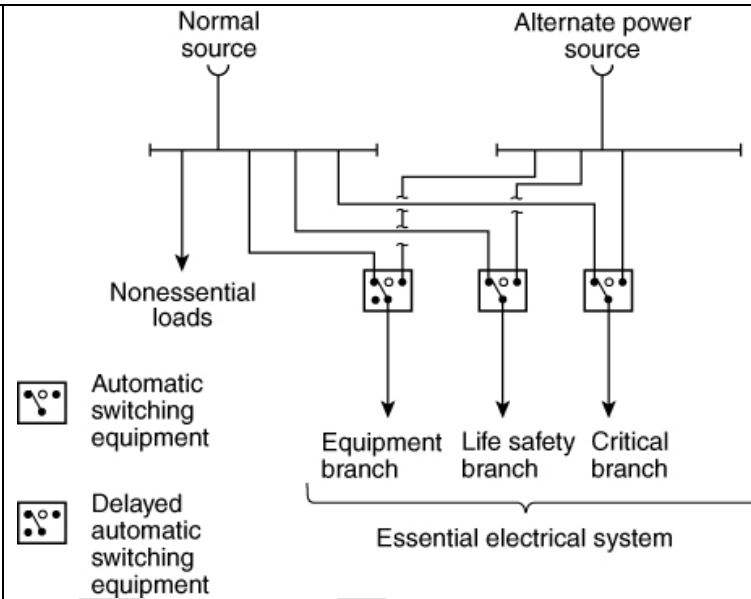
- (a) Raceways, cables, or enclosures of the life safety and critical branch shall be readily identified as a component of the essential electrical system (EES). Boxes and enclosures (including transfer switches, generators, and power panels) shall be field- or factory-marked and identified as a component of the EES. Raceways and cables shall be field- or factory-marked as a component of the EES at intervals not to exceed 7.6 m (25 ft).
- (b) Conductors of the life safety branch or critical branch shall not enter the same raceways, boxes, or cabinets with each other or any other wiring system. It shall be permitted for the branch conductors to occupy common equipment, raceways, boxes, or cabinets of other circuits not part of the life safety branch and critical branch where such wiring complies with one of the following:
 - (1) Is in transfer equipment enclosures
 - (2) Is in exit or emergency luminaires supplied from two sources
 - (3) Is in a common junction box attached to exit or emergency luminaires supplied from two sources
 - (4) Is for two or more circuits supplied from the same branch and same transfer switch

- (c) The wiring of the equipment branch shall be permitted to occupy the same raceways, boxes, or cabinets of other circuits that are not part of the essential electrical system
- (d) Where Category 2 (general care) locations are served from two separate transfer switches on the essential electrical system in accordance with 517.18(A), Exception No. 3, the Category 2 (general care) circuits from the two separate systems shall be kept independent of each other.
- (e) Where Category 1 (critical care) locations are served from two separate transfer switches on the essential electrical system in accordance with 517.19(A), Exception No. 2, the critical care circuits from the two separate systems shall be kept independent of each other.

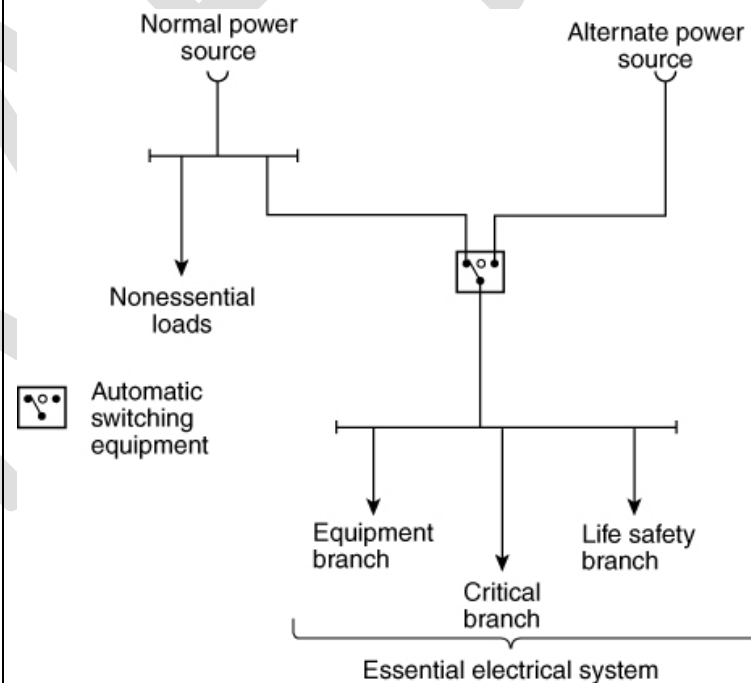
(2) **Isolated Power Systems.** Where isolated power systems are installed in any of the areas in 517.34(A)(1) and (A)(2), each system shall be supplied by an individual circuit serving no other load.

(3) **Mechanical Protection of the Essential Electrical System.** The wiring of the life safety and critical branches shall be mechanically protected by raceways. [99:6.7.5.2.2] Where installed as branch circuits in patient care spaces, the installation shall comply with the requirements of 517.13(A) and (B) and 250.118. Only the following wiring methods shall be permitted:

- (1) Nonflexible metal raceways, Type MI cable, Type RTRC marked with the suffix -XW, or Schedule 80 PVC conduit. Nonmetallic raceways shall not be used



Informational Note Figure 517.31(B)(1) Type 1 Essential Electrical System — Minimum Requirement (Greater Than 150 kVA) for Transfer Switch Arrangement.



Informational Note Figure 517.31(B)(2) Type 1 Essential Electrical System — Minimum Requirement (150 kVA or Less) for Transfer Switch Arrangement.

(1) **Optional Loads.**

Loads served by the generating equipment not specifically named in this article shall be served by their own transfer switches such that the following conditions apply:

- (1) These loads shall not be transferred if the transfer will overload the generating equipment.
- (2) These loads shall be automatically shed upon generating equipment overloading.

for branch circuits that supply patient care areas.

- (2) Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.
- (3) Listed flexible metal raceways and listed metal sheathed cable assemblies in any of the following:
 - a. Where used in listed prefabricated medical headwalls
 - b. In listed office furnishings
 - c. Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage
 - d. Where necessary for flexible connection to equipment
 - e. For equipment that requires a flexible connection due to movement, vibration, or operation
 - f. Luminaires installed in ceiling structures
- (4) Flexible power cords of appliances or other utilization equipment connected to the emergency system.
- (5) Cables for Class 2 or Class 3 systems permitted by Part VI of this article, with or without raceways.

Informational Note: See 517.13 for additional grounding requirements in patient care areas.

(D) Capacity of Systems. The essential electrical system shall have the capacity and rating to meet the maximum actual demand likely to be produced by the connected load.

Feeders shall be sized in accordance with 215.2 and Part III of Article 220. The alternate power source(s) required in 517.30 shall have the capacity and rating to meet the demand produced by the load at any given time.

Demand calculations for sizing of the alternate power source(s) shall be based on any of the following:

- (1) Prudent demand factors and historical data
- (2) Connected load
- (3) Feeder calculation procedures described in Article 220
- (4) Any combination of the above

The sizing requirements in 700.4 and 701.4 shall not apply to alternate sources.

(E) Receptacle Identification. The cover plates for the electrical receptacles supplied from the life safety and critical branches shall have a distinctive color or marking so as to be readily identifiable. [99:6.7.2.3.5(B)]

(F) Feeders from Alternate Power Source. A single feeder supplied by a local or remote alternate source shall be permitted to supply the essential electrical equipment shall be permitted at other than the location of the alternate power source.

(G) Coordination. Overcurrent protective devices serving the essential electrical system shall be coordinated for the period of time that a

(2) Contiguous Facilities.

Hospital power sources and alternate power sources shall be permitted to serve the essential electrical systems of contiguous or same-site facilities.

(C) Wiring Requirements.

(1) Separation from Other Circuits.

The life safety branch and critical branch [of the essential electrical system] shall be kept independent of all other wiring and equipment. [99:6.7.5.2.1]

(a) Raceways, cables, or enclosures of the life safety and critical branch shall be readily identified as components of the essential electrical system (EES). Boxes and enclosures (including transfer switches, generators, and power panels) shall be field- or factory-marked and identified as components of the EES. Raceways and cables shall be field- or factory-marked as components of the EES at intervals not to exceed 7.6 m (25 ft).

(b) Conductors of the life safety branch or critical branch shall not enter the same raceways, boxes, or cabinets with each other or any other wiring system. Branch conductors shall be permitted to occupy common equipment, raceways, boxes, or cabinets of other circuits not part of the life safety branch and critical branch where such wiring complies with one of the following:

- (1) Is in transfer equipment enclosures
- (2) Is in exit or emergency luminaires supplied from two sources
- (3) Is in a common junction box attached to exit or emergency luminaires supplied from two sources
- (4) Is for two or more circuits supplied from the same branch and same transfer switch

(c) The wiring of the equipment branch shall be permitted to occupy the same raceways, boxes, or cabinets of other circuits that are not part of the essential electrical system.

(d) Where Category 2 locations are served from two separate transfer switches on the essential electrical system in accordance with 517.18(A), Exception No. 3, the Category 2 circuits from the two separate systems shall be kept independent of each other.

(e) Where Category 1 locations are served from two separate transfer switches on the essential electrical system in accordance with 517.19(A), Exception No. 2, the critical care circuits from the two separate systems shall be kept independent of each other.

(2) Isolated Power Systems.

Where isolated power systems are installed in any of the areas in 517.34(A)(1) and (A)(2), each system shall be supplied by an individual circuit serving no other load.

(3) Mechanical Protection of the Essential Electrical System.

The wiring of the life safety and critical branches shall be mechanically protected by raceways. Where installed as branch circuits in patient care spaces, the installation shall comply with the requirements of 517.13(A) and (B) and 250.118. Only the following wiring methods shall be permitted:

(1) Nonflexible metal raceways, Type MI cable, RTRC marked with the suffix -XW, or Schedule 80 PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care spaces.

fault's duration extends beyond 0.1 second.

Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

Exception No. 1: Between transformer primary and secondary overcurrent protective devices, where only one overcurrent protective device or set of overcurrent protective devices exists on the transformer secondary.

Exception No. 2: Between overcurrent protective devices of the same size (ampere rating) in series.

Informational Note No. 1: The terms *coordination* and *coordinated* as used in this section do not cover the full range of overcurrent conditions.

Informational Note No. 2: See 517.17(C) for information on requirements for the coordination of ground-fault protection.

(2) Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care spaces.

(3) Listed flexible metal raceways and listed metal sheathed cable assemblies, as follows:

- a. Where used in listed prefabricated medical headwalls
- b. In listed office furnishings
- c. Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage
- d. Where necessary for flexible connection to equipment
- e. For equipment that requires a flexible connection due to movement, vibration, or operation
- f. Luminaires installed in ceiling structures

(4) Flexible power cords of appliances or other utilization equipment connected to the essential electrical system.

(5) Cables for Class 2 or Class 3 systems permitted in Part VI of this article, with or without raceways.

Informational Note: See **517.13** for additional grounding requirements in patient care areas.

(D) Capacity of Systems.

The essential electrical system shall have the capacity and rating to meet the maximum actual demand likely to be produced by the connected load.

Feeders shall be sized in accordance with **215.2** and Part III of Article **220**. The alternate power source(s) required in **517.30** shall have the capacity and rating to meet the demand produced by the load at any given time.

Demand calculations for sizing of the alternate power source(s) shall be based on any of the following:

- (1) Prudent demand factors and historical data
- (2) Connected load
- (3) Feeder calculations
- (4) Any combination of the above

The sizing requirements in **700.4** and **701.4** shall not apply to alternate sources.

(E) Receptacle Identification.

The electrical receptacles or the cover plates for the electrical receptacles supplied from the life safety and critical branches shall have a distinctive color or marking so as to be readily identifiable. [99:6.7.2.2.5(B)]

(F) Feeders from Alternate Power Source.

A single feeder supplied by a local or remote alternate power source shall be permitted to supply the essential electrical system to the point at which the life safety, critical, and equipment branches are separated. Installation of the transfer equipment shall be permitted at other than the location of the alternate power source.

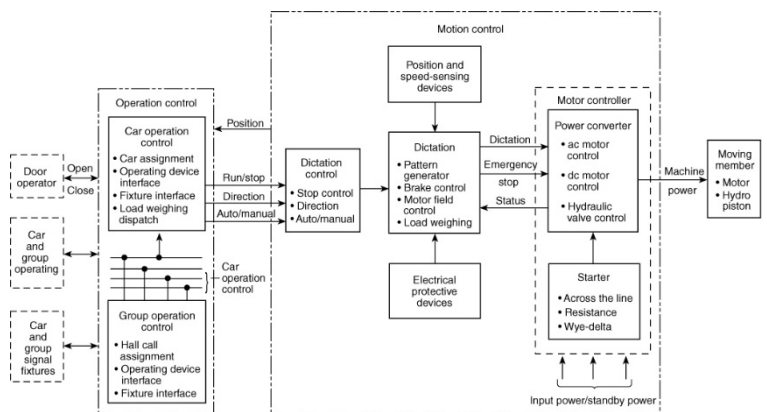
				<p>(G) Coordination. Overcurrent protective devices serving the essential electrical system shall be coordinated for the period of time that a fault's duration extends beyond 0.1 second.</p> <p><u>Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.</u></p> <p><i>Exception No. 1: Coordination shall not be required between transformer primary and secondary overcurrent protective devices where only one overcurrent protective device or set of overcurrent protective devices exists on the transformer secondary.</i></p> <p><i>Exception No. 2: Coordination shall not be required between overcurrent protective devices of the same size (ampere rating) in series.</i></p> <p>Informational Note No. 1: The terms <i>coordination</i> and <i>coordinated</i> as used in this section do not cover the full range of overcurrent conditions.</p> <p>Informational Note No. 2: See 517.17(C) for information on requirements for the coordination of ground-fault protection.</p>	
S	555.4	Location of Service Equipment	<p>555.4 Location of Service Equipment. The service equipment for a floating building, dock, or marina shall be located on land adjacent to the structure served, but not on or in the structure itself or any other floating structure.</p> <p><i>Exception: In existing installations, the service may be located in or on the building only by prior approval from the authority having jurisdiction.</i></p>	<p>555.4 Location of Service Equipment. The service equipment for a floating building, dock, or marina shall be located on land no closer than 1.5 m (5 ft) horizontally from and adjacent to the structure served, but not on or in the structure itself or any other floating structure. Service equipment shall be elevated a minimum of 300 mm (12 in.) above the electrical datum plane.</p> <p><i>Exception: In existing installations, the service may be located in or on the building only by prior approval from the authority having jurisdiction.</i></p>	Because of Seattle existing waterfront, SDCI recommends keeping this 2020 SEC exception. Note: The state of WA amendment notes that "adjacent means within sight".
S & W	555.5	Maximum Voltage	<p>555.5 Maximum Voltage. Pier Power distribution shall not exceed 250 volts phase to phase. Pier power distribution systems, where qualified personnel service the equipment under engineering supervision, shall be permitted to exceed 250 volts but these systems shall not exceed 600 volts.</p>	<p>555.5 Maximum Voltage. Pier Power distribution shall not exceed 250 volts phase to phase. Pier power distribution systems, where qualified personnel service the equipment under engineering supervision, shall be permitted to exceed 250 volts (but these systems shall not exceed 600 volts.) <u>by prior approval from the authority having jurisdiction. Conductors in excess of 600 volts, nominal shall not be installed on floating portions of floating buildings or similar facilities.</u></p>	There may be the upcoming desire to allow 26kV installed on the pier for cruise ship power. This has been proposed, but not yet.
W	555.7	Transformers		<p>555.7 Transformers. (A) General. Transformers and enclosures shall be identified for wet locations. The bottom of transformer enclosures shall not be located below the electrical datum plane. (B) Replacements. Transformers and enclosures shall be identified for wet locations where replacements are made.</p> <p><u>For the purposes of NEC 555.7, transformer terminations must be located a minimum of 12 inches above the deck of a dock (datum plane requirements do not apply for this section).</u></p> <p><u>Informational Note: WAC 296-46B-555 (1) Transformer Terminations</u></p>	We have not had this in the code in the past but it's a good idea. It could be confusing because 555.5 does not allow over 150 volt to ground, thus no transformers on a pier or dock.
S	555.25	Luminaires Required	<p>555.25 Luminaires Required. All walkways over water shall be illuminated to provide safe egress.</p>	<p>555.25 Luminaires Required. All walkways over water shall be illuminated to provide safe egress.</p>	No changes. Carry over 2020 SEC amendment into 2023 SEC.

			<u>Informational Note: Chapter 4 of the <i>Seattle Building Code</i> requires that waterfront structures comply with Chapter 10 for means of egress requirements, including illumination.</u>	<u>Informational Note: Chapter 4 of the <i>Seattle Building Code</i> requires that waterfront structures comply with Chapter 10 for means of egress requirements, including illumination.</u>	
W	555.30	Electrical Equipment and Connections		<p>555.30 Electrical Equipment and Connections.</p> <p>(A) General. All electrical components within electrical equipment (excluding wiring methods) and connections not intended for operation while submerged shall be located at least 305 mm (12 in.) above the deck of a fixed or floating structure, but not below the electrical datum plane. Conductor splices, within junction boxes identified for wet locations, utilizing sealed wire connector systems listed and identified for submersion shall be required for floating structures where located above the waterline but below the electrical datum plane.</p> <p>(B) Replacements. Replacement electrical connections shall be located at least 305 mm (12 in.) above the deck of a floating or fixed structure. Conductor splices, within junction boxes identified for wet locations, utilizing sealed wire connector systems listed and identified for submersion shall be required where located above the waterline but below the electrical datum plane.</p> <p><u>For the purposes of NEC 555.30, all electrical connections must be installed a minimum of 12 inches above the deck of a pier unless the connections are within junction boxes identified for wet locations, utilizing sealed wire connector systems listed and identified for submersion. (datum plane requirements do not apply for this section).</u></p> <p><u>Informational Note: WAC 296-46B-555 (3) Electrical connections</u></p>	We have not had this in the code in the past but it's a good idea.
W	555.31	Electrical Equipment Enclosures.		<p>555.31 Electrical Equipment Enclosures.</p> <p>(A) Securing and Supporting. Electrical equipment enclosures installed on piers above deck level shall be securely and substantially supported by structural members, independent of any conduit connected to them. If enclosures are not attached to mounting surfaces by means of external ears or lugs, the internal screw heads shall be sealed to prevent seepage of water through mounting holes.</p> <p>(B) Location. Electrical equipment enclosures on piers shall be located so as not to interfere with mooring lines.</p> <p><u>For the purposes of NEC 555.31, all enclosures must be corrosion resistant. All gasketed enclosures must be arranged with a weep hole to discharge condensation.</u></p> <p><u>Informational Note: WAC 296-46B-555 (4) Electrical Equipment</u></p>	We have not had this in the code in the past but it's a good idea.
W	555.51	Feeder Conductors (floating building)		<p>555.51 Feeder Conductors. Each floating building shall be supplied by a single set of feeder conductors from its service equipment.</p> <p><i>Exception:</i> <i>Where the floating building has multiple occupancy, each occupant shall be permitted to be supplied by a single set of feeder conductors extended from the occupant's service equipment to the occupant's panelboard.</i></p> <p><u>Where shore power is provided, a disconnecting means must be located within sight of each floating building or similar facility. The disconnecting means must be installed adjacent to but not in or on the floating building or similar facility.</u></p>	We have not had this in the code in the past but it's a good idea.

				Informational Note: WAC 296-46B-555 (8) Disconnect means within sight	
W	555.53	Ground-Fault Protection	555.53 Ground-Fault Protection. The main overcurrent protective device that feeds the floating building shall have ground-fault protection not exceeding ((400)) 30 mA. Ground-fault protection of each individual branch or feeder circuit shall be permitted as a suitable alternative.	555.53 Ground-Fault Protection. The main overcurrent protective device that feeds the floating building shall have ground-fault protection not exceeding ((400 mA)) 30mA. Ground-fault protection of each individual branch or feeder circuit shall be permitted as a suitable alternative. Outdoor outlets, shore power outlets, and boat hoists located at floating buildings shall comply with 555.35(B) and (C). Informational Note: Requirements of WAC 296-46B-555(9) incorporated herein	SDCI recommends keeping the reduction for ground fault protection in floating buildings in the 2020 SEC now also adopted by the state of Washington. We can now change this to a Washington amendment. We also recommend including the changes by the NEC re: outdoor outlets, shore power outlets and boat hoists. Add informational note acknowledging WAC rule adoption.
S	590.4	General	none	Modify 590.4(A) to indicate use-permit needs to be established for temp. service	

Article 600 Special Equipment

S	620.1	Scope	<p>620.1 Scope. This article covers the installation of electrical equipment and wiring used in connection with elevators, dumbwaiters, escalators, moving walks, platform lifts, and stairway chairlifts.</p> <p>Informational Note No. 1: For further information, see ASME A17.1-((2016))2019/CSA B44-16, <i>Safety Code for Elevators and Escalators</i>.</p> <p>Informational Note No. 2: For further information, see CSA B44.1-11/ASME-A17.5-2014, <i>Elevator and Escalator Electrical Equipment</i>.</p> <p>Informational Note No. 3: The term <i>wheelchair lift</i> has been changed to <i>platform lift</i>. For further information, see ASME A18.1-((2014))2017, <i>Safety Standard for Platform Lifts and Stairway Chairlifts</i>.</p> <p>Informational Note No. 4: See Chapter 7 of the <i>Seattle Building Code</i> for requirements to pressurize elevator hoistways and elevator lobbies.</p> <p>Informational Note No. 5: See Chapter 10 of the <i>Seattle Building Code</i> for requirements for elevators serving as an accessible means of egress component (in buildings that have a required accessible floor that is four or more stories above or below the level of exit discharge) and for pressurization of elevator lobbies used as an area of refuge.</p>	<p>620.1 Scope. This article covers the installation of electrical equipment and wiring used in connection with elevators, dumbwaiters, escalators, moving walks, platform lifts, and stairway chairlifts.</p> <p>Informational Note No. 1: See ASME A17.1-2019/CSA B44-19, <i>Safety Code for Elevators and Escalators</i>, for information on the installation of elevators and escalators.</p> <p>Informational Note No. 2: See CSA B44.1:19/ASME A17.5-2019, <i>Elevator and escalator electrical equipment</i>, for information on elevator and escalator electrical equipment.</p> <p>Informational Note No. 3: See ASME A18.1-2020, <i>Safety Standard for Platform Lifts and Stairway Chairlifts</i>, for information on installation of platform lifts and stairway chairlifts. The term <i>wheelchair lift</i> has been changed to platform lift.</p> <p>Informational Note No. 4: The motor controller, motion controller, and operation controller are located in a single enclosure or a combination of enclosures.</p> <p>Informational Note No. 5: See Informational Note Figure 620.1 for information only.</p> <p>Informational Note No. 6: See Chapter 7 of the <i>Seattle Building Code</i> for requirements to pressurize elevator hoistways and elevator lobbies.</p> <p>Informational Note No. 7: See Chapter 10 of the <i>Seattle Building Code</i> for requirements for elevators serving as an accessible means of egress component (in buildings that have a required accessible floor that is four or more stories above or below the level of exit discharge) and for pressurization of elevator lobbies used as an area of refuge.</p>	<p>SDCI recommends updating the editions of the standards in Information Notes No. 2 and 3 and renumbering 2020 Informational Notes No. 4 and 5 to No.6 and 7 in the 2023 SEC. This is done so we are correlated with the editions of the standards adopted by the State of Washington.</p>
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Informational Note Figure 620.1 Control System.

N	620.2	Definitions	<p>620.2 Definitions. The following definitions shall apply only within this article.</p> <p>((Informational Note No. 1: The motor controller, motion controller, and operation controller are located in a single enclosure or a combination of enclosures.))</p> <p>Informational Note((No. 2)):Informational Note Figure 620.2, No. 2 is for information only.</p>	<p>NEC removed 620.2 from the 2023 NEC.</p> <p>Keep: Informational Note((No. 2)):Informational Note Figure 620.2, No. 2 is for information only.</p>	<p>NEC removed the definitions from this article and placed them into Article 100. Keep 2020 Info note 2.</p>
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S	620.5	Working Clearances	<p>620.5 Working Clearances. Working space shall be provided about controllers, disconnecting means, and other electrical equipment in accordance with ((110.26(A) and 110.32.)) <u>the Seattle Building Code, Chapter 30, and the following:</u></p> <p>(1) <u>The clear working space in front of a disconnecting means shall be not less than 1,220 mm (48 in.) in depth and 760 mm (30 in.) in width.</u></p> <p>(2) <u>Elevator machine rooms are required to have not less than 2,130 mm (84 in.) of headroom, per ASME A17.1- 2010/CSA B44-10, Safety Code for Elevators and Escalators.</u></p> <p>((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.</p> <p>(A) Flexible Connections to Equipment. Electrical equipment in (A)(1) through (A)(4) is provided with flexible leads to all external connections so that it can be repositioned to meet the clear working space requirements of 110.26:</p> <p>(1) Controllers and disconnecting means for dumbwaiters, escalators, moving walks, platform lifts, and stairway chairlifts installed in the same space with the driving machine</p> <p>(2) Controllers and disconnecting means for elevators installed in the hoistway or on the car</p> <p>(3) Controllers for door operators</p> <p>(4) Other electrical equipment installed in the hoistway or on the car</p> <p>(B) Guards. Live parts of the electrical equipment are suitably guarded, isolated, or insulated to reduce the likelihood of inadvertent contact with live parts operating at voltages greater than 30 volts ac rms, 42 volts ac peak, or 60 volts dc, and the equipment can be examined, adjusted, serviced, or maintained while energized without removal of this protection.</p> <p>(C) Examination, Adjusting, and Servicing. Electrical equipment is not required to be examined, adjusted, serviced, or maintained while energized.</p> <p>(D) Low Voltage. Uninsulated parts are at a voltage not greater than 30 volts rms, 42 volts peak, or 60 volts dc.))</p>	<p>620.5 Working Clearances. Working space shall be provided about controllers, disconnecting means, and other electrical equipment in accordance with <u>110.26(A).</u></p> <p>Where conditions of maintenance and supervision ensure that only qualified persons examine, adjust, service, and maintain the equipment, the clearance requirements of <u>110.26(A)(1)</u> shall not be required where ((any-of)) the condition ((s-in)) of 620.5(A)(1) ((through (D) are)) <u>is</u> met.</p> <p>(A) Flexible Connections to Equipment. Electrical equipment in the following is provided with flexible leads to all external connections so that it can be repositioned to meet the clear working space requirements of <u>110.26:</u></p> <p>(1) Controllers and disconnecting means for ((dumbwaiters,)) escalators, moving walks ((, platform lifts, and stairway chairlifts installed in the same space with the driving machine</p> <p>(2) Controllers and disconnecting means for elevators installed in the hoistway or on the car</p> <p>(3) Controllers for door operators</p> <p>(4) Other electrical equipment installed in the hoistway or on the car</p> <p>(B) Guards. Live parts of the electrical equipment are suitably guarded, isolated, or insulated to reduce the likelihood of inadvertent contact with live parts operating at voltages greater than 30 volts ac rms, 42 volts ac peak, or 60 volts dc, and the equipment can be examined, adjusted, serviced, or maintained while energized without removal of this protection.</p> <p>(C) Examination, Adjusting, and Servicing. Electrical equipment is not required to be examined, adjusted, serviced, or maintained while energized.</p> <p>(D) Low Voltage. Uninsulated parts are at a voltage not greater than 30 volts rms, 42 volts peak, or 60 volts dc.</p> <p><u>Informational Note No. 1: For additional requirements, see 3020.6 of the Seattle Building Code.</u></p>	<p>SDCI recommends adding reference to SBC 3020.6. State doesn't have working clearance—they use NEC. For additional requirements, see 3020.6 of the Seattle Building Code. Don't need 620.5 (1) and (2), see reference to 110.26 (A). Need to keep portable escalators and disconnects. 620.5(A) flexible lead connections.</p> <p>Only need Section 110.26(A)(1) keeping this will also cover TABLE 110.26 (A) (1).</p>
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N	620.6	Ground-Fault Circuit-Interrupter Protection for Personnel.	<p>620.6 Ground-Fault Circuit-Interrupter Protection for Personnel.</p> <p>Each 125-volt, single-phase, 15- and 20-ampere receptacle installed in pits, in hoistways, on the cars of elevators and dumbwaiters, associated with wind turbine tower elevators, on the platforms or in the runways and machinery spaces of platform lifts and stairway chairlifts, and in escalator and moving walk wellways shall be of the ground-fault circuit-interrupter type.</p> <p>All 125-volt, single-phase, 15- and 20-ampere receptacles installed in machine rooms, control spaces, machinery spaces, and control rooms shall have ground-fault circuit-interrupter protection for personnel.</p> <p>A permanently installed sump pump shall be permanently wired or shall be supplied by a single receptacle that is ground-fault circuit-interrupter protected</p>	<p>620.6 Ground-Fault Circuit-Interrupter Protection for Personnel.</p> <p><i>N</i> (A) Pits, Hoistways, and on Cars. Each 125-volt, single-phase, 15- and 20-ampere receptacle installed in pits, in hoistways, on the cars of elevators and dumbwaiters, ((associated with wind turbine tower)) elevators, on the platforms or in the runways and machinery spaces of platform lifts and stairway chairlifts, and in escalator and moving walk wellways shall be a listed Class A ground-fault circuit-interrupter type.</p> <p><i>N</i> (B) Machine Rooms, Control Spaces, Machinery Spaces, Control Rooms, and Truss Interiors. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in machine rooms, control spaces, machinery spaces, control rooms, and truss interiors shall have listed Class A ground-fault circuit-interrupter protection for personnel.</p> <p><i>N</i> (C) Sump Pumps. A permanently installed sump pump shall be permanently wired or shall be supplied by a receptacle that is protected by a listed Class A ground-fault circuit-interrupter.</p>	<p>NEC organizational change. Carry over 2020 SEC amendment re: wind turbine powers and overlay onto newly reorganized NEC language.</p>
S	620.21	Wiring Methods	<p>620.21 Wiring Methods. Conductors, cables, and optical fiber cables located in hoistways, escalator and moving walk wellways, platform lifts, stairway chairlift runways, machinery spaces, control spaces, in or on cars, machine rooms, and control rooms, not including the traveling cables connecting the car or counterweight and hoistway wiring, shall be installed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, rigid nonmetallic conduit, or wireways ((or shall be Type MC, MI, or AC cable)) unless otherwise ((permitted)) specified in 620.21(A) through (C). Unused conductors in an enclosure shall be insulated or protected from accidental contact with exposed live parts.</p> <p><u>Type MC cable or Type MI cable may be permitted to be installed in elevator spaces only by special permission of the authority having jurisdiction.</u></p> <p>((Exception: Cords and cables of listed cord and plug connected equipment shall not be required to be installed in a raceway.))</p> <p>Informational Note: When an elevator is classified as a fire service access elevator or occupant evacuation operation elevator, some building codes require additional protection for conductors that are located outside of the elevator hoistway and machine room.</p> <p>(A) Elevators.</p> <p>(1) Hoistways and Pits.</p> <p>(a) ((Cables used in Class 2 power limited circuits shall be permitted, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.)) <u>Feeders shall be permitted inside the hoistway for elevators with driving machine motors located in the hoistway or on the car or counterweight.</u></p> <p>(b) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.</p> <p>(c) The following wiring methods shall be permitted in the hoistway in lengths not to exceed 1.8 m (6 ft):</p>	<p>620.21 Wiring Methods. Conductors, cables, and optical fiber cables located in hoistways, escalator and moving walk wellways, platform lifts, stairway chairlift runways, machinery spaces, control spaces, in or on cars, machine rooms, and control rooms, not including the traveling cables connecting the car or counterweight and hoistway wiring, shall be installed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, rigid nonmetallic conduit, or wireways, or shall be Type MC, MI, or AC cable unless otherwise permitted in <u>620.21(A)</u> through (C). Unused conductors in an enclosure shall be insulated or protected from accidental contact with exposed live parts.</p> <p><i>Exception: Cords and cables of listed cord-and-plug-connected equipment shall not be required to be installed in a raceway.</i></p> <p>Informational Note: When an elevator is classified as a fire service access elevator or occupant evacuation operation elevator, some building codes require additional protection for conductors that are located outside of the elevator hoistway and machine room.</p> <p>(A) Elevators.</p> <p>(1) Hoistways and Pits.</p> <p>(a) Types CL2P, CL2R, and CL2 cables shall be permitted, provided the cables are supported and protected from physical damage. Substitute cables for Class 2 cables installed in accordance with <u>722.135(E)</u> shall be permitted. Feeders shall be permitted inside the hoistway for elevators with driving machine motors located in the hoistway or on the car or counterweight.</p> <p>(b) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.</p> <p>(c) The following wiring methods shall be permitted in the hoistway in lengths not to exceed 1.8 m (6 ft):</p> <p>(1) Flexible metal conduit.</p> <p>(2) Liquidtight flexible metal conduit.</p>	<p>SDCI recommends carrying over SEC 2020 amendment re: prohibiting low voltage cable run without being in conduit from hoistways, moving walk wellways, etc (strike new language from 2023 NEC. 2020 SEC MC cable limitation amendment being eliminated in 2023 SEC. Now are allowing MC cable and are removing the limitations on its use. Removed metric units from SEC amendments.</p>

- (1) Flexible metal conduit.
- (2) Liquidtight flexible metal conduit.
- (3) ((Liquidtight flexible nonmetallic conduit.)) Reserved
- (4) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage, shall be of a flame-retardant type, and shall be part of one of the following:
 - ~~((a) Listed equipment~~
 - ~~(b) Driving machine~~
 - ~~(c) Driving machine brake~~

~~((Exception 620.21(A)(1)(c)(1), (A)(1)(c)(2), and (A)(1)(c)(3): The conduit length shall not be required to be limited between risers and limit switches, interlocks, operating buttons, and similar devices.))~~

- (d) A sump pump or oil recovery pump located in the pit shall be permitted to be cord connected. The cord shall be a hard usage oil-resistant type, of a length not to exceed 1.8 m (6 ft), and shall be located to be protected from physical damage.
- ~~((e) Hard service cords and junior hard service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections between the fixed wiring in the hoistway and hoistway access switches when located in the hoistway door sight guard.~~

Informational Note: See ASME A17.1 2016/CSA B44-16, Safety Code for Elevators and Escalators.)

- (e) Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in hoistways between risers and limit switches, interlocks, operating buttons, and similar devices. Flexible conduit runs are limited to 1.8 m (6 ft) in length.
- (f) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire-resistive construction.

(2) Cars.

- (a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size 3/8), or larger, not exceeding ~~((1.8 m (6 ft) in length))~~ 915 mm (3 ft), shall be permitted on cars where so located as to be free from oil and if securely fastened in place. Flexible conduit of any type shall not be placed in locations where it would be subject to physical damage.

~~((Exception: Liquidtight flexible nonmetallic conduit of metric designator 12 (trade size 3/8), or larger, as defined by 356.2(2), shall be permitted in lengths in excess of 1.8 m (6 ft).))~~

- (b) Hard-service cords and junior hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates. Hard-service cords only shall

~~(3) Liquidtight flexible nonmetallic conduit. Reserved~~

- ~~(4) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage, shall be of a flame-retardant type, and shall be part of one of the following: Reserved~~

- ~~a. Listed equipment~~
- ~~b. Driving machine~~
- ~~c. Driving machine brake~~

~~Exception to 620.21(A)(1)(c)(1), (A)(1)(c)(2), and (A)(1)(c)(3): The conduit length shall not be required to be limited between risers and limit switches, interlocks, operating buttons, and similar devices.~~

- (d) A sump pump or oil recovery pump located in the pit shall be permitted to be cord connected. The cord shall be a hard usage oil-resistant type, of a length not to exceed 1.8 m (6 ft), and shall be located to be protected from physical damage.

~~(e) Hard service cords and junior hard service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections between the fixed wiring in the hoistway and hoistway access switches when located in the hoistway door sight guard. RESERVED~~

(f) Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in hoistways between risers and limit switches, interlocks, operating buttons, and similar devices. Flexible conduit runs are limited to 1.8 m (6 ft) in length.

(g) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire-resistive construction.

Informational Note: See ASME A17.1-2019/CSA B44-19, Safety Code for Elevators and Escalators.

(2) Cars.

- (a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size 3/8), or larger, not exceeding ~~1.8 m (6 ft)~~ 900 mm (3 ft) in length, shall be permitted on cars where so located as to be free from oil and if securely fastened in place. Flexible conduit of any type shall not be placed in locations where it would be subject to physical damage.

~~Exception: Liquidtight flexible nonmetallic conduit (LFNC-B) of metric designator 12 (trade size 3/8) or larger shall be permitted in lengths in excess of 1.8 m (6 ft).~~

- (b) Hard-service cords and junior hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates. Hard-service cords only shall be permitted as flexible connections for the top-of-car operating device or the car-top work light. Devices or luminaires shall be grounded by means of an equipment grounding conductor run with the circuit conductors. Cables with smaller conductors and other types and thicknesses of insulation and jackets shall be permitted as flexible

(e), (f), and additional language in (2), pulled from 2020 SEC
Amended (a)

be permitted as flexible connections for the portable top-of-car operating device or the portable car-top work light. Devices or luminaires shall be grounded by means of an equipment grounding conductor run with the circuit conductors. Cables with smaller conductors and other types and thicknesses of insulation and jackets shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates, if listed for this use.

~~(c) (Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type)) Nonmetallic raceways and wireways shall not be installed on cars located in hoistways required to be of noncombustible fire-resistive construction.~~

(d) The following wiring methods shall be permitted on the car assembly in lengths not to exceed ~~((1.8 m (6 ft)))~~ 3 ft:

- (1) Flexible metal conduit
- (2) Liquidtight flexible metal conduit
- (3) Liquidtight flexible nonmetallic conduit
- (4) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage and shall be of a flame-retardant type and shall be part of one of the following:
 - a. Listed equipment
 - b. A driving machine
 - c. A driving machine brake

Δ (3) Within Machine Rooms, Control Rooms, and Machinery Spaces and Control Spaces.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size 3/8), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted between control panels and machine motors, machine brakes, motor-generator sets, disconnecting means, and pumping unit motors and valves.

~~((Exception: Liquidtight flexible nonmetallic conduit metric designator 12 (trade size 3/8) or larger, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).))~~

(b) Where motor-generators, machine motors, or pumping unit motors and valves are located adjacent to or underneath control equipment and are provided with extra-length terminal leads not exceeding 1.8 m (6 ft) in length, such leads shall be permitted to be extended to connect directly to controller terminal studs without regard to the carrying-capacity requirements of Articles 430 and 445. Auxiliary gutters shall be permitted in

connections between the fixed wiring on the car and devices on the car doors or gates, if listed for this use.

~~(c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type. Nonmetallic raceways and wireways shall not be installed on cars located in hoistways required to be of noncombustible fire-resistive construction.~~

(d) The following wiring methods shall be permitted on the car assembly in lengths not to exceed 1.8 m (6 ft) ~~900mm~~ 3ft

- (1) Flexible metal conduit
- (2) Liquidtight flexible metal conduit
- (3) Liquidtight flexible nonmetallic conduit
- (4) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage and shall be of a flame-retardant type and shall be part of one of the following:
 - a. Listed equipment
 - b. A driving machine
 - c. A driving machine brake

(3) Within Machine Rooms, Control Rooms, and Machinery Spaces and Control Spaces.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size 3/8), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted between control panels and machine motors, machine brakes, motor-generator sets, disconnecting means, and pumping unit motors and valves.

~~Exception: Liquidtight flexible nonmetallic conduit (LFNC-B) metric designator 12 (trade size 3/8) or larger shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).~~

(b) Where motor-generators, machine motors, or pumping unit motors and valves are located adjacent to or underneath control equipment and are provided with extra-length terminal leads not exceeding 1.8 m (6 ft) in length, such leads shall be permitted to be extended to connect directly to controller terminal studs without regard to the carrying-capacity requirements of Articles 430 and 445. Auxiliary gutters shall be permitted in machine and control rooms between controllers, starters, and similar apparatus.

(c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) On existing or listed equipment, conductors shall also be permitted to be grouped together and taped or corded without being installed in a raceway.

machine and control rooms between controllers, starters, and similar apparatus.

- (c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.
- (d) On existing or listed equipment, conductors shall also be permitted to be grouped together and taped or corded without being installed in a raceway. Such cable groups shall be supported at intervals not over 900 mm (3 ft) and located so as to be protected from physical damage.
- (e) Flexible cords and cables in lengths not to exceed ((1.8 m (6 ft))) 915 mm (3 ft) that are of a flame-retardant type and located to be protected from physical damage shall be permitted in these rooms and spaces without being installed in a raceway. They shall be part of one of the following:
 - (1) Listed equipment
 - (2) A driving machine
 - (3) A driving machine brake

Δ **(4) Counterweight.** The following wiring methods shall be permitted on the counterweight assembly in lengths not to exceed 1.8 m (6 ft):

- (1) Flexible metal conduit
- (2) Liquidtight flexible metal conduit
- (3) Liquidtight flexible nonmetallic conduit
- (4) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage, shall be of a flame-retardant type, and shall be part of one of the following:
 - a. Listed equipment
 - b. A driving machine
 - c. A driving machine brake

(B) Escalators.

- (1) **Wiring Methods.** Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in escalator and moving walk wellways. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size 3/8) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size 3/8), nominal, or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

- (2) **Class 2 Circuit Cables.** Cables used in Class 2 power-limited circuits shall be permitted to be installed within escalators and moving walkways, provided the cables are ((supported)) installed in a raceway for protection ((and protected))from

Such cable groups shall be supported at intervals not over 900 mm (3 ft) and located so as to be protected from physical damage.

(e) Flexible cords and cables in lengths not to exceed ((1.8 m (6 ft))) 915 mm (3 ft) that are of a flame-retardant type and located to be protected from physical damage shall be permitted in these rooms and spaces without being installed in a raceway. They shall be part of one of the following:

- (1) Listed equipment
- (2) A driving machine
- (3) A driving machine brake

(4) Counterweight. The following wiring methods shall be permitted on the counterweight assembly in lengths not to exceed ~~1.8 m (6 ft)~~ 915 mm (3 ft):

- (1) Flexible metal conduit
- (2) Liquidtight flexible metal conduit
- (3) Liquidtight flexible nonmetallic conduit
- (4) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage, shall be of a flame-retardant type, and shall be part of one of the following:
 - a. Listed equipment
 - b. A driving machine
 - c. A driving machine brake

(B) Escalators.

(1) Wiring Methods. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in escalator and moving walk wellways. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size 3/8) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size 3/8), nominal or larger liquidtight flexible nonmetallic conduit (LFNC-B) shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) Class 2 Circuit Cables. Types CL2P, CL2R, and CL2 cables shall be permitted to be installed within escalators and moving walkways, provided the cables are ((supported and protected)) installed in a raceway for protection from physical damage and the cables are of a jacketed and flame-retardant type. Substitute cables for Class 2 cables installed in accordance with 722.135(E) shall be permitted.

(3) Flexible Cords. Hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections on escalators and moving walk control panels and disconnecting means where the

			<p>physical damage and the cables are of a jacketed and flame-retardant type.</p> <p>(3) Flexible Cords. Hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections on escalators and moving walk control panels and disconnecting means where the entire control panel and disconnecting means are arranged for removal from machine spaces as permitted in 620.5.</p> <p>(c) Platform Lifts and Stairway Chairlift Raceways.</p> <p>(1) Wiring Methods. Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in platform lifts and stairway chairlift runways and machinery spaces. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size 3/8) shall be permitted in lengths not in excess of 1.8 m (6 ft).</p> <p>Exception: Metric designator 12 (trade size 3/8) or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).</p> <p>(2) Class 2 Circuit Cables. ((Cables)) Traveling cables used in Class 2 power-limited circuits shall be permitted to be installed within platform lifts and stairway chairlift runways and machinery spaces, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.</p> <p>(3) Flexible Cords and Cables. Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.</p>	<p>entire control panel and disconnecting means are arranged for removal from machine spaces as permitted in 620.5.</p> <p>(C) Platform Lifts and Stairway Chairlift Raceways.</p> <p>(1) Wiring Methods. Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in platform lifts and stairway chairlift runways and machinery spaces. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size 3/8) shall be permitted in lengths not in excess of 1.8 m (6 ft).</p> <p>Exception: Metric designator 12 (trade size 3/8) or larger liquidtight flexible nonmetallic conduit (LFNC-B) shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).</p> <p>(2) Class 2 Circuit Cables. Types CL2P, CL2R, and CL2 traveling cables shall be permitted to be installed within platform lifts and stairway chairlift runways and machinery spaces, provided the cables are supported and protected from physical damage. Substitute cables for Class 2 cables installed in accordance with 722.135(E) shall be permitted.</p> <p>(3) Flexible Cords and Cables. Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.</p>	
S	620.26	Panelboards	<p>620.26 Panel Boards. All branch circuits required by 620.22, 620.23, and 620.25 shall originate from a panel board in the elevator machine room or control room.</p> <p><i>Exception 1: A separate branch circuit for pit lighting and receptacle shall be allowed in accordance with 620.24 from other than in the elevator machine room or control room.</i></p> <p><i>Exception 2: Private residence elevators are exempt from this ordinance.</i></p>	<p>620.26 Panelboards. All branch circuits required by 620.22, 620.23, and 620.25 shall originate from a panelboard in the elevator machine room or control room. The panelboard enclosure may have a door with a latch but the enclosure door cannot be lockable.</p> <p><i>Exception 1: A separate branch circuit for pit lighting and receptacle shall be allowed in accordance with 620.24 from other than in the elevator machine room or control room.</i></p> <p><i>Exception 2: Private residence elevators are exempt from this ordinance.</i></p>	SDCI recommends changing panelboard to one word to match NEC style. Use of “panelboard” is appropriate. This is a defined term in the NEC. The last sentence is new. Word lockable is used throughout NEC.
S	620.27	Prohibited Equipment in Elevator Machine Room or Control Room	<p>620.27 Prohibited Equipment in Elevator Machine Room or Control Room. Any electrical equipment on the line side of the panel board required in 620.26 or elevator disconnecting means shall be prohibited from the elevator machine room or the control room. This equipment shall be permitted to be installed only by special permission of the authority having jurisdiction.</p> <p><i>Exception: Transformers 30 kva or less supplying associated elevator or machine/control room loads and subject to the following:</i></p>	<p>620.27 Prohibited Equipment in Elevator Machine Room or Control Room. Any electrical equipment on the line side of the panelboard required in 620.26, including a main breaker in the panelboard, or elevator disconnecting means, shall be prohibited in the elevator machine room or the control room.</p> <p><i>Exception: Transformers 30 kva or less, and their associated secondary conductor overcurrent protection/disconnects, supplying associated elevator or machine/control room loads, and subject to the following:</i></p> <p><i>1. Required elevator machine/control room electrical clearances shall be maintained.</i></p>	Highlighted term panelboard should be one word. SDCI recommends including language to clarify that a main breaker in the panel would be considered equipment on line-side. Also, allow xfmr disconnects/ocpd.

			<p><u>1. Required elevator machine/control room electrical clearances shall be maintained.</u></p> <p><u>2. The added heat load of the transformer shall be considered for machine/control room heating and cooling and ventilation. The BTUs of the transformer and the elevator equipment manufacturer shall be included in the HVAC calculation for the elevator machine/control room to ensure safe and normal operation of the elevator.</u></p> <p><u>3. The heat output of the transformer in BTUs shall be posted in a visible location on the transformer.</u></p>	<p><u>2. The added heat load of the transformer shall be considered for machine/control room heating and cooling and ventilation. 2.The BTUs of the transformer and the elevator equipment manufacturer shall be included in the HVAC calculation for the elevator machine/control room to ensure safe and normal operation of the elevator.</u></p> <p><u>3. The heat output of the transformer in BTUs shall be posted in a visible location on the transformer.</u></p>	
620.44	Installation of Traveling Cables	<p>620.44 Installation of Traveling Cables. Traveling cables that are suitably supported and protected from physical damage shall be permitted to be run without the use of a raceway in either or both of the following:</p> <p>(1) When used inside the hoistway, on the elevator car, hoistway wall, counterweight, or controllers and machinery that are located inside the hoistway, provided the cables are in the original sheath.</p> <p>(2) From inside the hoistway, to elevator controller enclosures and to elevator car and machine room, control room, machinery space, and control space connections that are located outside the hoistway for a distance not exceeding 1.8 m (6 ft) in length as measured from the first point of support on the elevator car or hoistway wall, or counterweight where applicable, provided the conductors are ((grouped together and taped or corded, or)) in the original sheath. These traveling cables shall be permitted to be continued to this equipment.</p>	<p>620.44 Installation of Traveling Cables. Traveling cables that are suitably supported and protected from physical damage shall be permitted to be run without the use of a raceway in either or both of the following:</p> <p>(1) When used inside the hoistway, on the elevator car, hoistway wall, counterweight, or controllers and machinery that are located inside the hoistway, provided the cables are in the original sheath.</p> <p>(2) From inside the hoistway, to elevator controller enclosures and to elevator car and machine room, control room, machinery space, and control space connections that are located outside the hoistway for a distance not exceeding 1.8 m (6 ft) in length as measured from the first point of support on the elevator car or hoistway wall, or counterweight where applicable, provided the conductors are ((grouped together and taped or corded, or)) in the original sheath. These traveling cables shall be permitted to be continued to this equipment.</p>	No changes. Carry over 2020 SEC amendment and overlay on 2023 NEC language.	
620.51		<p>620.51 Disconnecting Means. A single means for disconnecting all ungrounded main power supply conductors for each elevator, dumbwaiter, escalator, moving walk, platform lift, or stairway chairlift shall be provided and be designed so that no pole can be operated independently. Where multiple driving machines are connected to a single elevator, escalator, moving walk, or pumping unit, there shall be one disconnecting means to disconnect the motor(s) and control valve operating magnets.</p> <p>The disconnecting means for the main power supply conductors shall not disconnect the branch circuits required in 620.22, 620.23, and 620.24.</p> <p>Δ (A) Type. The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker that is lockable only in the open position in accordance with 110.25. The disconnecting means shall be a listed device.</p> <p>Informational Note: For additional information, see ASME A17.1-2016/CSA B44-16, Safety Code for Elevators and Escalators.</p> <p><i>Exception No. 1: Where an individual branch circuit supplies a platform lift, the disconnecting means required by 620.51(C)(4) shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be lockable open in accordance with 110.25.</i></p> <p><i>Exception No. 2: Where an individual branch circuit supplies a stairway chairlift located within a dwelling unit, the stairway chairlift shall be permitted to be cord-and-plug-connected, provided it complies with 422.16(A) and the cord does not exceed 1.8 m (6 ft) in length.</i></p>	<p>620.51 Disconnecting Means. A single means for disconnecting all ungrounded main power supply conductors for each elevator, dumbwaiter, escalator, moving walk, platform lift, or stairway chairlift shall be provided and be designed so that no pole can be operated independently. Where multiple driving machines are connected to a single elevator, escalator, moving walk, or pumping unit, there shall be one disconnecting means to disconnect the motor(s) and control valve operating magnets. The disconnecting means for the main power supply conductors shall not disconnect the branch circuits required in 620.22, 620.23, and 620.24.</p> <p>(A) Type. The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker that is lockable only in the open position in accordance with 110.25. <u>If circuit breaker type disconnect is used, it shall not have a door or cover over the breaker.</u> The disconnecting means shall be a listed device.</p> <p>Informational Note No. 1: See ASME A17.1-2019/CSA B44-19, <i>Safety Code for Elevators and Escalators</i>, for additional information.</p> <p>Informational Note No. 2: See ASME A18.1-2017, <i>Safety Standard for Platform Lifts and Stairway Chairlifts</i>, for additional information.</p> <p><i>Exception No. 1: Where an individual branch circuit supplies a platform lift, the disconnecting means required by 620.51(C)(4) shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be lockable open in accordance with 110.25.</i></p> <p><i>Exception No. 2: Where an individual branch circuit supplies a stairway chairlift or where a stairway chairlift is supplied by batteries as the primary source, the stairway chairlift shall be permitted to be cord-and-plug-connected, provided it complies with 422.16(A) and the cord does not exceed 1.8 m (6 ft) in length.</i></p> <p>(B) Operation.</p>	<p>SDCI proposes that no door or cover be required if the disconnecting means for elevators, etc is not an externally operated disconnect switch, meaning a circuit breaker type disconnect. SDCI proposes changing “individual branch circuit” to just branch circuit for stairway chairlifts(See exception 2). These chairlifts usually have less than 5A draw and requiring a dedicated branch circuit can be prohibitive for disabled folks. Added “where provided” to (F) Remove (G), redundant to requirements in 620.27</p>	

		<p>(B) Operation. No provision shall be made to open or close this disconnecting means from any other part of the premises. If sprinklers are installed in hoistways, machine rooms, control rooms, machinery spaces, or control spaces, the disconnecting means shall be permitted to automatically open the power supply to the affected elevator(s) prior to the application of water. No provision shall be made to automatically close this disconnecting means. Power shall only be restored by manual means. Informational Note: To reduce hazards associated with water on live elevator electrical equipment.</p> <p>(C) Location. The disconnecting means shall be located where it is readily accessible to qualified persons.</p> <p>(1) On Elevators Without Generator Field Control. On elevators without generator field control, the disconnecting means shall be located within sight of the motor controller. Where the motor controller is located in the elevator hoistway, the disconnecting means required by 620.51(A) shall be located outside the hoistway and accessible to qualified persons only. An additional fused or non-fused, enclosed, externally operable motorcircuit switch that is lockable open in accordance with 110.25 to disconnect all ungrounded main power-supply conductors shall be located within sight of the motor controller. The additional switch shall be a listed device and shall comply with 620.91(C).</p> <p>Driving machines or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.</p> <p>Where the driving machine of an electric elevator or the hydraulic machine of a hydraulic elevator is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power-supply conductors shall be provided and be lockable open in accordance with 110.25.</p> <p>(2) On Elevators with Generator Field Control. On elevators with generator field control, the disconnecting means shall be located within sight of the motor controller for the driving motor of the motor-generator set. Driving machines, motor-generator sets, or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment. Where the driving machine or the motor-generator set is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power-supply conductors shall be provided and be lockable open in accordance with 110.25.</p> <p>(3) On Escalators and Moving Walks. On escalators and moving walks, the disconnecting means shall be installed in the space where the controller is located.</p>	<p>No provision shall be made to open or close this disconnecting means from any other part of the premises. If sprinklers are installed in hoistways, machine rooms, control rooms, machinery spaces, or control spaces, the disconnecting means shall be permitted to automatically open the power supply to the affected elevator(s) prior to the application of water. No provision shall be made to automatically close this disconnecting means. Power shall only be restored by manual means.</p> <p>Informational Note: To reduce hazards associated with water on live elevator electrical equipment.</p> <p>(C) Location. The disconnecting means shall be located where it is readily accessible to qualified persons.</p> <p>Informational Note: See Seattle Building Code 3020.6 for specific location requirements of disconnects</p> <p>(1) On Elevators Without Generator Field Control. On elevators without generator field control, the disconnecting means shall be located within sight of the motor controller. Where the motor controller is located in the elevator hoistway, the disconnecting means required by 620.51(A) shall be located outside the hoistway and accessible to qualified persons only. An additional fused or non-fused, enclosed, externally operable motor-circuit switch that is lockable open in accordance with 110.25 to disconnect all ungrounded main power-supply conductors shall be located within sight of the motor controller. The additional switch shall be a listed device and shall comply with 620.91(C).</p> <p>Driving machines or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.</p> <p>Where the driving machine of an electric elevator or the hydraulic machine of a hydraulic elevator is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power-supply conductors shall be provided and be lockable open in accordance with 110.25.</p> <p>(2) On Elevators with Generator Field Control. On elevators with generator field control, the disconnecting means shall be located within sight of the motor controller for the driving motor of the motor-generator set. Driving machines, motor-generator sets, or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment. Where the driving machine or the motor-generator set is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power-supply conductors shall be provided and be lockable open in accordance with 110.25.</p> <p>(3) On Escalators and Moving Walks. On escalators and moving walks, the disconnecting means shall be installed in the space where the controller is located.</p> <p>(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.</p> <p>(D) Identification and Signs.</p> <p>(1) Available Fault Current Field Marking.</p>	
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		<p>(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.</p> <p>Δ (D) Identification and Signs.</p> <p>(1) More than One Driving Machine. Where there is more than one driving machine in a machine room, the disconnecting means shall be numbered to correspond to the identifying number of the driving machine that they control. The disconnecting means shall be provided with a sign to identify the location of the supply side overcurrent protective device.</p> <p>(2) Available Fault Current Field Marking. Where an elevator control panel is used, it shall be legibly marked in the field with the available fault current at its line terminals. The field marking(s) shall include the date the available fault current calculation was performed and be of sufficient durability to withstand the environment involved.</p> <p>When modifications to the electrical installation occur that affect the available fault current at the elevator control panel, the available fault current shall be verified or recalculated as necessary to ensure the elevator control panel's short-circuit current rating is sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) shall be adjusted to reflect the new level of available fault current.</p> <p>(E) Surge Protection. Where any of the disconnecting means in 620.51 has been designated as supplying an emergency system load, a legally required system load, or a critical operation power system load, listed surge protection shall be provided.</p> <p>(F) Automatic Power Disconnect Device Control Circuit. The control circuit for a required automatic power disconnect device or shunt trip shall be derived either from:</p> <p>(1) <u>Within the disconnecting means enclosure when the shunt trip circuit equipment is a part of the listed assembly and the control-circuit controls only the disconnect(s) within the listed equipment; or</u></p> <p>(2) <u>A dedicated circuit from an appropriate panelboard located in the machine room.</u></p> <p>(G) Prohibited Equipment in Elevator Machine room or Control Room. Any electrical equipment on the line side of the disconnecting means and control shall be prohibited from the elevator machine room or control room. This equipment shall be permitted to be installed only by prior permission of the authority having jurisdiction.</p>	<p>The disconnecting means shall be legibly marked in the field with the available fault current at its line terminals. The field marking(s) shall include the date the available fault current calculation was performed and be of sufficient durability to withstand the environment involved.</p> <p>When modifications to the electrical installation occur that affect the available fault current at the disconnecting means, the available fault current shall be verified or recalculated as necessary to ensure the elevator equipment's short-circuit current rating is sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) shall be adjusted to reflect the new level of available fault current.</p> <p>(E) Surge Protection. Where any of the disconnecting means in 620.51 has been designated as supplying an emergency system load, a legally required system load, or a critical operation power system load, a listed SPD shall be installed.</p> <p>(F) Automatic Power Disconnect Device Control Circuit (Where Provided). <u>The control circuit for a required automatic power disconnect device or shunt trip shall be derived either from:</u></p> <p>(1) <u>Within the disconnecting means enclosure when the shunt trip circuit equipment is a part of the listed assembly and the control-circuit controls only the disconnect(s) within the listed equipment; or</u></p> <p>(2) <u>A dedicated circuit from an appropriate panelboard located in the machine room.</u></p> <p>(G) Prohibited Equipment in Elevator Machine room or Control Room. <u>Any electrical equipment on the line side of the disconnecting means and control shall be prohibited in the elevator machine room or control room.</u></p> <p><u>Exception: Transformers 30 kVA or less supplying associated elevator or machine/control room loads and subject to the following:</u></p> <p><u>1. Required elevator machine/control room electrical clearances shall be maintained.</u></p> <p><u>2. The added heat load of the transformer shall be considered for machine/control room heating and cooling and ventilation.</u></p>	
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			<p><u>Exception: Transformers 30 kVA or less supplying associated elevator or machine/control room loads and subject to the following:</u></p> <p><u>1. Required elevator machine/control room electrical clearances shall be maintained.</u></p> <p><u>2. The added heat load of the transformer shall be considered for machine/control room heating and cooling and ventilation.</u></p>		
	620.53	Car Light, Receptacle(s), and Ventilation Disconnecting Means	<p>Δ 620.53 Car Light, Receptacle(s), and Ventilation Disconnecting Means. Elevators shall have a single means for disconnecting all ungrounded car light, receptacle(s), and ventilation power-supply conductors for that elevator car.</p> <p>The disconnecting means shall be an enclosed, externally operable, fused motor-circuit switch or circuit breaker that is lockable open in accordance with 110.25 and shall be located in the machine room or control room for that elevator car. ((Where there is no machine room or control room outside the hoistway, the disconnecting means shall be located outside the hoistway and accessible to qualified persons only.))</p> <p>Disconnecting means shall be numbered to correspond to the identifying number of the elevator car whose light source they control.</p> <p>The disconnecting means shall be provided with a sign to identify the location of the supply side overcurrent protective device.</p> <p><i>Exception: Where a separate branch circuit supplies car lighting, a receptacle(s), and a ventilation motor not exceeding 2 hp, the disconnecting means required by 620.53 shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be lockable open in accordance with 110.25.</i></p>	<p>620.53 Car Light, Receptacle(s), and Ventilation Disconnecting Means. Elevators shall have a single means for disconnecting all ungrounded car light, receptacle(s), and ventilation power-supply conductors for that elevator car.</p> <p>The disconnecting means shall be an enclosed, externally operable, fused motor-circuit switch or circuit breaker that is lockable open in accordance with 110.25 and shall be located in the machine room or control room for that elevator car. ((Where there is no machine room or control room outside the hoistway, the disconnecting means shall be located outside the hoistway and accessible to qualified persons only.))</p> <p>Disconnecting means shall be numbered to correspond to the identifying number of the elevator car whose light source they control.</p> <p>The disconnecting means shall be provided with a sign to identify the location of the supply side overcurrent protective device.</p> <p><i>Exception: Where a separate branch circuit supplies car lighting, a receptacle(s), and a ventilation motor not exceeding 2 hp, the disconnecting means required by 620.53 shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be lockable open in accordance with 110.25.</i></p>	No changes. Keep 2023 SEC amendment and overlay on 2023 NEC Language.
N	620.62	Selective Coordination	<p>620.62 Selective Coordination. Where more than one driving machine disconnecting means is supplied by the same source, the overcurrent protective devices in each disconnecting means shall be selectively coordinated with any other supply side overcurrent protective devices.</p> <p>Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection and device settings shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.</p> <p><i>Exception No. 1: Selective coordination shall not be required between transformer primary and secondary overcurrent protective devices where only one overcurrent device or set of overcurrent devices exists on the transformer secondary.</i></p> <p><i>Exception No. 2: Selective coordination shall not be required between overcurrent protective devices of the same rating located in series where no loads are connected in parallel with the downstream device.</i></p> <p><u><i>Exception 3: When an electrical engineer provides stamped fault current calculations, the overcurrent protective devices in each disconnecting means may be selectively coordinated with any other supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.</i></u></p>	<p>620.62 Selective Coordination. Where more than one driving machine disconnecting means is supplied by the same source, the overcurrent protective devices in each disconnecting means shall be selectively coordinated with any other supply-side overcurrent protective devices.</p> <p>Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection and device settings shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.</p> <p><i>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.</i></p> <p><u><i>Exception No. 2: When an electrical engineer provides stamped fault current calculations, the overcurrent protective devices in each disconnecting means may be selectively coordinated with any other supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.</i></u></p>	2023 NEC combines 2020 exceptions 1 and 2 together to correlate with 700.32 and 701.32. [FR-9368] Seattle exception #3 has been renumbered to exception #2.
S	620.71	((Guarding)) Securing Equipment	<p>620.71 ((Guarding)) Securing Equipment. Elevator, dumbwaiter, escalator, and moving walk driving machines; motor-generator sets; motor controllers; and disconnecting means shall be installed in a</p>	<p>620.71 Guarding Securing Equipment. Elevator, dumbwaiter, escalator, and moving walk driving machines; motor-generator sets; motor controllers; and disconnecting means shall be installed in a room or space set aside for that purpose unless otherwise</p>	Information about NON-ELEVATOR equipment not being allowed in the machine room has been relocated from an information note into the main requirements of the section. Informational notes are not enforceable, just a

			<p>room or space set aside for that purpose unless otherwise permitted in 620.71(A) or (B). The room or space shall be secured against unauthorized access.</p> <p><i>Exception: Elevator motor controllers may be installed, with permission of the authority having jurisdiction, in a hoistway.</i></p> <p>Informational Note: Non-elevator equipment, wiring, pipes, and other materials are prohibited in elevator hoistways, pits, machine rooms and spaces. Only such equipment and wiring that pertain to the elevator and its operation are permitted in these elevator spaces. See Chapter 30 of the <i>Seattle Building Code</i>.</p> <p>(A) Motor Controllers. ((Motor controllers shall be permitted outside the spaces herein specified, provided they are in enclosures with doors or removable panels that are capable of being locked in the closed position and the disconnecting means is located adjacent to or is an integral part of the motor controller.)) Motor controller enclosures for escalator or moving walks shall be permitted in the balustrade on the side located away from the moving steps or moving treadway. If the disconnecting means is an integral part of the motor controller, it shall be operable without opening the enclosure.</p> <p>(B) Driving Machines. Elevators with driving machines located on the car, on the counterweight, or in the hoistway, and driving machines for dumbwaiters, platform lifts, and stairway lifts, shall be permitted outside the spaces herein specified.</p>	<p>permitted in 620.71(A) or (B). The room or space shall be secured against unauthorized access.</p> <p><u>Non-elevator equipment, wiring, pipes, and other materials are prohibited in elevator hoistways, pits, machine rooms and control rooms. Only such equipment and wiring that pertain directly to the elevator and its operation are permitted in these spaces. See Chapter 30 of the <i>Seattle Building Code</i>.</u></p> <p><i>Exception: Elevator motor controllers may be installed, with permission of the authority having jurisdiction, in a hoistway.</i></p> <p>(A) Motor Controllers. ((Motor controllers shall be permitted outside the spaces herein specified, provided they are in enclosures with doors or removable panels that are capable of being locked in the closed position and the disconnecting means is located adjacent to or is an integral part of the motor controller.)) Motor controller enclosures for escalator or moving walks shall be permitted in the balustrade on the side located away from the moving steps or moving treadway. If the disconnecting means is an integral part of the motor controller, it shall be operable without opening the enclosure.</p> <p>(B) Driving Machines. Elevators with driving machines located on the car, on the counterweight, or in the hoistway, and driving machines for dumbwaiters, platform lifts, and stairway lifts, shall be permitted outside the spaces herein specified.</p>	<p>comment about the article or to look in other articles which may pertain to this code. This requirement will be in both the elevator code (SBC, Chapter 30) and this section of the 2023 SEC.</p>
620.91	Emergency and Standby Power Systems.		<p>620.91 Emergency and Standby Power Systems. ((Elevators shall be permitted to be powered by an emergency or standby power system.)) <u>Elevator power system requirements are determined by the <i>Seattle Building Code</i>.</u></p> <p>Informational Note No. 1: See ASME A17.1-2016/CSA B44-16, Safety Code for Elevators and Escalators, 2.27.2, for additional information.</p> <p>Informational Note No. 2: <u>See Chapter 7 of the <i>Seattle Building Code</i> for requirements to pressurize elevator hoistways and elevator lobbies.</u></p> <p><u>Informational Note No. 3: See Chapter 10 of the <i>Seattle Building Code</i> for requirements for elevators serving as an accessible means of egress component (in buildings that have a required accessible floor that is four or more stories above or below the level of exit discharge) and for pressurization of elevator lobbies used as an area of refuge.</u></p> <p>Informational Note No. 4: When an elevator is classified as a fire service access elevator or occupant evacuation operation elevator, some building codes require the elevator equipment, elevator hoistway lighting, ventilation and cooling equipment for elevator machine rooms, control rooms, machine spaces, and control spaces as well as elevator car lighting to be supplied by standby power systems in compliance with Article 701.</p> <p>(A) Regenerative Power. For elevator systems that regenerate power back into the power source that is unable to absorb the regenerative power under overhauling elevator conditions, a means shall load be provided to absorb this power.</p> <p>(B) Other Building Loads. Other building loads, such as power and lighting, shall be permitted as the energy absorption means required in 620.91(A), provided that such loads are automatically connected to the emergency or</p>	<p>620.91 Emergency and Standby Power Systems. ((Elevators shall be permitted to be powered by an emergency or standby power system.)) <u>Elevator power system requirements are determined by the <i>Seattle Building Code</i>.</u></p> <p>Informational Note No. 1: See ASME A17.1-2016/CSA B44-16, Safety Code for Elevators and Escalators, 2.27.2, for additional information.</p> <p><u>Informational Note No. 2: When an elevator is classified as a fire service access elevator or occupant evacuation operation elevator, ((some building codes require)) the elevator equipment, elevator hoistway lighting, ventilation and cooling equipment for elevator machine rooms and control rooms, elevator car lighting, as well as elevator pit sump pumps should be supplied by emergency or standby power systems as required by the <i>Seattle Building Code</i>.</u></p> <p>Informational Note No. 3: See Chapter 7 of the <i>Seattle Building Code</i> for requirements to pressurize elevator hoistways and elevator lobbies.</p> <p>Informational Note No. 4: See Chapter 10 of the <i>Seattle Building Code</i> for requirements for elevators serving as an accessible means of egress component (in buildings that have a required accessible floor that is four or more stories above or below the level of exit discharge) and for pressurization of elevator lobbies used as an area of refuge.</p> <p>(A) Regenerative Power. For elevator systems that regenerate power back into the power source that is unable to absorb the regenerative power under overhauling elevator conditions, a means shall load be provided to absorb this power.</p> <p>(B) Other Building Loads. Other building loads, such as power and lighting, shall be permitted as the energy absorption means required in 620.91(A), provided that such loads are automatically connected to the emergency or standby power system operating the elevators and are large enough to absorb the elevator regenerative power.</p> <p>(C) Disconnecting Means. The disconnecting means required by 620.51 shall disconnect the elevator from both the emergency or standby power system and the normal power system.</p>	<p>Keep 2020 amendments and overlay on 2023 NEC.</p> <p>Changed organization of informational notes.</p> <p>Modify informational note #2, formerly 4, as it is confusing and we already direct them to SBC with other informational notes.</p>

			standby power system operating the elevators and are large enough to absorb the elevator regenerative power. (C) Disconnecting Means. The disconnecting means required by 620.51 shall disconnect the elevator from both the emergency or standby power system and the normal power system. Where an additional power source is connected to the load side of the disconnecting means, which allows automatic movement of the car to permit evacuation of passengers, the disconnecting means required in 620.51 shall be provided with an auxiliary contact that is positively opened mechanically, and the opening shall not be solely dependent on springs. This contact shall cause the additional power source to be disconnected from its load when the disconnecting means is in the open position.	Where an additional power source is connected to the load side of the disconnecting means, which allows automatic movement of the car to permit evacuation of passengers, the disconnecting means required in 620.51 shall be provided with an auxiliary contact that is positively opened mechanically, and the opening shall not be solely dependent on springs. This contact shall cause the additional power source to be disconnected from its load when the disconnecting means is in the open position.	
S	<u>625.2</u>	Definitions	None	<p>Definitions: The following definitions shall apply only within this article.</p> <p>EV charging stations and EV-Ready parking spaces. A minimum of 40-ampere dedicated 208/240-volt branch circuit shall be installed for each EV Ready parking space and each EV Charging Station. The branch circuits shall terminate at a receptacle outlet or EV charger in close proximity to the proposed location of the EV Ready parking space or the EV Charging Station.</p> <p>EV-Capable parking spaces. A listed raceway capable of accommodating a minimum of 40- ampere dedicated 208/240-volt branch circuit shall be installed for each EV-Capable parking space. The raceway shall terminate into a cabinet, box or other enclosure in close proximity to the proposed location of the EV-Capable parking space. Raceways and related components that are planned to be installed EV Charging per the state underground, and in enclosed, inaccessible or concealed areas and spaces, shall be installed at the time of original construction.</p> <p>Electric vehicle charging infrastructure for accessible parking spaces. Ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Charging Stations. Additional 10 percent of the accessible parking spaces, rounded to the next whole number, shall be EV Ready. Not fewer than one for each type of EV charging system shall be accessible. The electric vehicle charging infrastructure may also serve adjacent parking spaces not designated as accessible parking. A maximum of 10 percent of the accessible parking spaces, rounded to the next whole number, are allowed to be included in the total number of electric vehicle parking spaces required.</p>	ON HOLD! Definitions could be placed under Article 100 which is the current style manual for the NEC in lieu of 620.2. At 625.2 is the old style for definitions.
S	625.27	625.27 Requirements for Electrical Vehicle Charging Outlets.	<p>625.27 Requirements for Electrical Vehicle Charging Outlets. New parking spaces provided on a lot when a new building is constructed shall be “EV-ready” as specified in 625.27 (A) or (B). When calculating the number of required EV-ready parking spaces, any fraction or portion of an EV-ready parking space required shall be rounded up to the nearest whole number.</p> <p><i>Exception: The Director may, in consultation with the Director of Seattle City Light, reduce the requirements of this section where there is substantial evidence substantiating that the added electrical load that can be attributed to meeting these requirements will alter the local utility infrastructure design requirements on the utility side of the legal point of service, so as to require on-property power transformation; or require an upgrade to an existing residential electrical service. In these cases, the maximum quantity of EV charging infrastructure required to be installed shall be reduced to the maximum service size that would not require changes to transformation or existing electrical service capacity. The Director may first reduce the required level of EV infrastructure at EV-ready parking spaces from 40-amp</i></p>	<p>625.27 Requirements for Electrical Vehicle Charging Outlets. New parking spaces provided on a lot when a new building is constructed shall be “EV-ready” as specified in 625.27 (A) or (B). When calculating the number of required EV-ready parking spaces, any fraction or portion of an EV-ready parking space required shall be rounded up to the nearest whole number.</p> <p>(A) Residential uses:</p> <ol style="list-style-type: none"> When parking for an individual dwelling (SFR or Duplex) unit is provided in a private garage, carport, or parking area, separate from any parking facilities serving other units, one parking space for each dwelling in that garage, carport, or parking area shall be EV-ready. When parking for all Group R occupancies multifamily residential uses is provided in a surface parking area or parking garage serving multiple residences, the number of parking spaces that shall be EV-ready, EV Charging Stations and EV-Capable parking space shall 	<p>ON HOLD!</p> <p>The state code has the requirement for Group A, E, M: “2. Group A, Group E, and Group M occupancies shall comply with one of the following, whichever is greater: 2.1. The provisions of Section 429.2 shall apply only to designated employee parking spaces. 2.2. One of each 200 parking spaces or fraction thereof shall be EV Ready. One of each 200 parking spaces or fraction thereof shall be an EV Charging Station.”</p> <p>PGF: Relocated exception to end of article to match NEC style. Do we want to remove this?</p>

		<p><i>to 20-amp circuits. If necessary, the Director may also then reduce the number of required EV-ready parking spaces or otherwise reduce the level of EV infrastructure at EV-ready parking spaces.</i></p> <p>(A) Residential uses:</p> <p>(1) <u>When parking for any individual dwelling unit is provided in a private garage, carport, or parking area, separate from any parking facilities serving other units, at least one parking space in that garage, carport, or parking area shall be EV-ready.</u></p> <p>(2) <u>When parking for multifamily residential uses is provided in a surface parking area serving multiple residences, the number of parking spaces that shall be EV-ready shall be as follows:</u></p> <p>(a) <u>When between one and six parking spaces are provided, each of those parking spaces shall be EV-ready.</u></p> <p>(b) <u>When between seven and 25 parking spaces are provided, a minimum of six of those parking spaces shall be EV-ready</u></p> <p>(c) <u>When more than 25 parking spaces are provided, a minimum of 20 percent of those parking spaces shall be EV-ready.</u></p> <p>(3) <u>When parking for multifamily residential uses is provided in a parking garage serving multiple residences, a minimum of 20 percent of those parking spaces shall be EV-ready.</u></p> <p>(4) <u>When parking is provided for all other residential uses, a minimum of 20 percent of those spaces shall be EV-ready.</u></p> <p>(B) Nonresidential uses: <u>When parking is provided for nonresidential uses, a minimum of ten percent of those spaces shall be EV-ready</u></p> <p><u>Informational note: Circuit breakers marked “line” and “load” may not be suitable for backfed or reverse current</u></p>	<p>be as follows:</p> <p>(a) <u>When between one and six parking spaces are provided, each of those parking spaces shall be EV- ready and one of which shall be an EV-Charging Station.</u></p> <p>(b) <u>When between seven and 25 parking spaces are provided, a minimum of six of those parking spaces shall be EV-ready and one additional parking space shall be an EV-Charging Station and one additional parking space shall be an EV-Capable parking space.</u></p> <p>(c) <u>When more than 25 parking spaces are provided, 10% shall be EV-Charging Station, a minimum of 20 additional 25 percent of those parking spaces shall be EV-ready and an additional 10% of those parking spaces shall be EV-Capable.</u></p> <p>(B) Nonresidential uses: <u>When parking is provided for nonresidential uses, a minimum of ten percent of those spaces shall be EV-ready ten percent shall be EV-Charging Station, additional 25 percent shall be EV-ready and an additional ten percent shall be EV-Capable.</u></p> <p><u>Exception:</u></p> <ol style="list-style-type: none"> 1. <u>Except for Group A, Group E, and Group M occupancies, on-site parking with less than 10 parking spaces shall not be required to comply with Section 625.27(B) but shall have at least ten percent or rounded to the next whole number EV-Ready parking space.</u> 2. <u>Group A, Group E, and Group M occupancies shall comply with one of the following, whichever is greater:</u> <ol style="list-style-type: none"> 2.1. <u>The provisions of Section 625.27(B) shall apply only to designated employee parking spaces.</u> 2.2. <u>Ten percent of parking spaces or fraction thereof rounded to the next whole number shall be EV Ready. One of each 200 parking spaces or fraction thereof shall be an EV Charging Station</u> <p><u>For all other than Group A, Group E, Group M, Ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Charging Stations.</u></p> <p>(C) Electric vehicle charging infrastructure for accessible parking spaces. <u>Ten percent of the Accessible Parking Spaces, rounded to the next whole number, shall be EV Charging Stations. An additional ten percent of the accessible parking spaces, rounded to the nearest whole number, shall be be EV Ready. (Not fewer than one for each type of EV charging system shall be accessible.?????)</u></p> <p><u>The electric vehicle charging infrastructure may also serve adjacent parking spaces not designated as accessible parking. A maximum of 10 percent of the accessible parking spaces, rounded to the next whole number, are allowed to be</u></p>	
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				<p><u>included in the total number of electric vehicle parking spaces required under 625.27(A) &(B).</u></p> <p>(D) Electrical room(s) and equipment. <u>Electrical room(s) and/or dedicated electrical equipment shall be sized to accommodate the requirements of Section 625.27. The electrical service and the electrical system, including any on-site distribution transformer(s), shall have sufficient capacity to simultaneously charge all EVs at all required EV Charging Stations, EV Ready parking spaces, and EV-Capable parking spaces at a minimum of 40-amperes each. EXCEPTION: Automatic Load Management System (ALMS) may be used to adjust the maximum electrical capacity required for the EV-Ready and EV-Capable parking spaces. The ALMS must be designed to allocate charging capacity among multiple future EV Charging Stations at a minimum of 16 amperes per EV charger.</u></p> <p><u>Exception: The Director may, in consultation with the Director of Seattle City Light, reduce the requirements of this section where there is substantial evidence substantiating that the added electrical load that can be attributed to meeting these requirements will alter the local utility infrastructure design requirements on the utility side of the legal point of service, so as to require on-property power transformation; or require an upgrade to an existing residential electrical service. In these cases, the maximum quantity of EV charging infrastructure required to be installed shall be reduced to the maximum service size that would not require changes to transformation or existing electrical service capacity. The Director may first reduce the required level of EV infrastructure at EV-ready parking spaces from 40-amp to 20-amp circuits. If necessary, the Director may also then reduce the number of required EV-ready parking spaces or otherwise reduce the level of EV infrastructure at EV-ready parking spaces.</u></p>	
S	625.42	Rating	None	<p>625.42 Rating. The EVSE shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 625.42(A) or (B).</p> <p>(A) Energy Management System (EMS). Where an EMS in accordance with 750.30 provides load management of EVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.</p> <p>(B) EVSE with Adjustable Settings. EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer’s instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. EVSE as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.</p>	<p>NEC change: By adding requirements that address the installation of branch circuit load management systems, consideration is given to technology that is now available for installation, such as Thermolec’s DCC-9 EV Energy Management System.</p>

N	625.49	Island Mode	None	N 625.49 Island Mode. EVPE and bidirectional EVSE that incorporate a power export function shall be permitted to be a part of an interconnected power system operating in island mode	New NEC section. ON HOLD.
	645.27	Selective Coordination	<p>645.27 Selective Coordination. Critical operations data system(s) overcurrent protective devices shall be selectively coordinated with all supply-side overcurrent protective devices.</p> <p>Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.</p> <p><i>Exception: When an electrical engineer provides stamped fault current calculations, the overcurrent protective devices in each disconnecting means may be selectively coordinated with any other supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.</i></p>	<p>645.27 Selective Coordination. Critical operations data system(s) overcurrent protective devices shall be selectively coordinated with all supply-side overcurrent protective devices.</p> <p>Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.</p> <p><i>Exception: When an electrical engineer provides stamped fault current calculations, the overcurrent protective devices in each disconnecting means may be selectively coordinated with any other supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.</i></p>	Carry over 2020 amendment and overlay onto 2023 NEC language.
S	680.32	Ground-Fault Circuit-Interrupter (GFCI) and Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection	None	<p>Δ 680.32 Ground-Fault Circuit-Interrupter (GFCI) and Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection. All electrical equipment, including power supply cords, used with storable pools shall have GFCI protection complying with 680.5(C), as applicable.</p> <p>All receptacles rated 125 volts through 250 volts, 60 amperes or less, located within 6.0 m (20 ft) of the inside walls of a storable pool, storable spa, or storable hot tubs shall have GFCI protection complying with 680.5(B) or SPGFCI protection complying with 680.5(C), as applicable. In determining these dimension, the distance to be measured shall be the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other effective permanent barrier.</p> <p>Informational Note: A ground fault circuit interrupter (GFCI) is a Class A device whereas a special purpose ground fault circuit interrupter (SPGFCI) is not. An SPGFCI can, however, be a Class C, D or E device. See Article 100 for the definition of, "Special Purpose Ground Fault Circuit Interrupter."</p>	Recommend not adopting. This Informational Note calls the Code end-user's attention to the definition of a term that has yet to achieve industry-wide understanding.
S	680.44	Ground-Fault Circuit-Interrupter (GFCI) and Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection		<p>Δ 680.44 Ground-Fault Circuit Interrupter (GFCI) and Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection.</p> <p>N (A) General. Except as otherwise provided in this section, the outlet(s) that supplies a self-contained spa or hot tub, a packaged spa or hot tub equipment assembly, or a field-assembled spa or hot tub shall have GFCI protection complying with 680.5(B) or SPGFCI protection complying with 680.5(C), as applicable.</p> <p>Δ (B) Listed Units. If so marked, a listed self-contained unit or a listed packaged equipment assembly that includes integral GFCI protection for all electrical parts within the unit or assembly (pumps, air blowers, heaters, lights, controls, sanitizer generators, wiring, and so forth) shall be permitted without additional ground-fault protection.</p> <p>N (C) Gas-Fired Water Heaters. Circuits serving gas-fired spa and hot tub water heaters operating separately from the spa or hot tub they serve, and operating at voltages above the low-voltage contact limit, shall be GFCI protected.</p>	Recommend not adopting the new informational note. This Informational Note calls the Code end-user's attention to the definition of a term that has yet to achieve industry-wide understanding.

				Informational Note:—A ground fault circuit interrupter (GFCI) is a Class A device whereas a special purpose ground fault circuit interrupter (SPGFCI) is not. An SPGFCI can, however, be a Class C, D or E device. See Article 100 for the definition of, “Special Purpose Ground Fault Circuit Interrupter.”	
680.73	Accessibility	<p>680.73 Accessibility. Hydromassage bathtub electrical equipment shall be accessible without damaging the building structure or building finish. Where the hydromassage bathtub is cord- and plug-connected with the supply receptacle accessible only through a service access opening, the receptacle shall be installed so that its face is within direct view and not more than 300 mm (1 ft) of the opening.</p> <p><u>The ground fault circuit interrupter device must be identified as to use and not located in a building or tub cavity, crawlspace, or attic.</u></p> <p><u>All electrical equipment installed to support the bathtub (e.g., disconnecting means, motor, etc.) must be accessible at the same grade level as the tub or from a landing on the exterior of the building without the use of a ladder or other access device.</u></p> <p><u>Informational Note: WAC 296-46B-680, requirements for special equipment such as swimming pools, fountains, and similar installations, is incorporated herein with edits.</u></p>	<p>680.73 Accessibility. Hydromassage bathtub electrical equipment shall be accessible without damaging the building structure or building finish. Where the hydromassage bathtub is cord- and plug-connected with the supply receptacle accessible only through a service access opening, the receptacle shall be installed so that its face is within direct view and not more than 300 mm (1 ft) of the opening.</p> <p><u>The ground fault circuit interrupter device must be identified as to use and not located in a building or tub cavity, crawlspace, or attic.</u></p> <p><u>All electrical equipment installed to support the bathtub (e.g., disconnecting means, motor, etc.) must be accessible at the same grade level as the tub or from a landing on the exterior of the building without the use of a ladder or other access device.</u></p> <p><u>Informational Note: WAC 296-46B-680, requirements for special equipment such as swimming pools, fountains, and similar installations, is incorporated herein with edits.</u></p>	No changes. Carry over 2020 amendment and overlay on 2023 NEC.	
690.1	Scope	<p>690.1 Scope. This article applies to solar PV systems, other than those covered by Article 691, including the array circuit(s), inverter(s), and controller(s) for such systems. The systems covered by this article include those interactive with other electric power production sources or stand-alone, or both. These PV systems may have ac or dc output for utilization.</p> <p>Informational Note No. 1 ((See Informational Note Figure 690.1(a) and Informational Note Figure 690.1(b))). See Section 80.51(B)(1)(h) of this code for inspection and plan review requirements when installing PV systems.</p> <p>Informational Note No. 2: Article 691 covers the installation of large-scale PV electric supply stations.</p>	<p>690.1 Scope. This article applies to solar PV systems, other than those covered by Article 691, including the array circuit(s), inverter(s), and controller(s) for such systems. The systems covered by this article include those interactive with other electric power production sources or stand-alone, or both. These PV systems may have ac or dc output for utilization.</p> <p>Informational Note No. 1 ((See Informational Note Figure 690.1(a) and Informational Note Figure 690.1(b))). See Section 80.51(B)(1)(h) of this code for inspection and plan review requirements when installing PV systems.</p> <p>Informational Note No. 2: Article 691 covers the installation of large-scale PV electric supply stations.</p>	PGF: Small NEC changes Need to double check if new organization for 80.51 PV review	
690.13	Photovoltaic System Disconnecting Means	<p>690.13 Photovoltaic System Disconnecting Means. Means shall be provided to disconnect the PV system from all wiring systems including power systems, energy storage systems, and utilization equipment and its associated premises wiring.</p> <p>(A) Location. The PV system disconnecting means shall be installed at a readily accessible location. Where disconnecting means of systems above 30 V are readily accessible to unqualified persons, any enclosure door or hinged cover that exposes live parts when open shall be locked or require a tool to open.</p> <p>Informational Note: PV systems installed in accordance with 690.12 address the concerns related to energized conductors entering a building.</p> <p>(B) Marking. Each PV system disconnecting means shall plainly indicate whether in the open (off) or closed (on) position and be permanently marked “PV SYSTEM DISCONNECT” or equivalent. Additional markings shall be permitted based upon the specific system configuration. For PV system disconnecting means where the line and</p>	<p>690.13 Photovoltaic System Disconnecting Means. Means shall be provided to disconnect the PV system from all wiring systems including power systems, energy storage systems, and utilization equipment and its associated premises wiring.</p> <p>(A) Location.</p> <p>N (1) Readily Accessible. The PV system disconnecting means shall be installed at a readily accessible location.</p> <p>N (2) Enclosure Doors and Covers. Where a disconnecting means for circuits operating above 30 volts is readily accessible to unqualified persons, an enclosure door or hinged cover that exposes energized parts when open shall have its door or cover locked or require a tool to be opened.</p> <p>(B) Marking. Each PV system disconnecting means shall plainly indicate whether in the open (off) or closed (on) position and be permanently marked</p>	Removed potentially misleading information about duty type for PV and refer only to interlocking. Minimal NEC changes.	

		<p>load terminals may be energized in the open position, the device shall be marked with the following words or equivalent:</p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;">ELECTRIC SHOCK HAZARD TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION</p> <p>The warning sign(s) or label(s) shall comply with 110.21(B).</p> <p>(C) Maximum Number of Disconnects. Each PV system disconnecting means shall consist of not more than six switches or six sets of circuit breakers, or a combination of not more than six switches and sets of circuit breakers, mounted in a single enclosure, or in a group of separate enclosures. A single PV system disconnecting means shall be permitted for the combined ac output of one or more inverters or ac modules in an interactive system.</p> <p style="padding-left: 40px;">Informational Note: This requirement does not limit the number of PV systems connected to a service as permitted in 690.4(D). This requirement allows up to six disconnecting means to disconnect a single PV system. For PV systems where all power is converted through interactive inverters, a dedicated circuit breaker, in 705.12(B)(1), is an example of a single PV system disconnecting means.</p> <p>(D) Ratings. The PV system disconnecting means shall have ratings sufficient for the maximum circuit current, available fault current, and voltage that is available at the terminals of the PV system disconnect.</p> <p>(E) Type of Disconnect. The PV system disconnecting means shall simultaneously disconnect the PV system conductors that are not solidly grounded from all conductors of other wiring systems. The PV system disconnecting means or its remote operating device or the enclosure providing access to the disconnecting means shall be capable of being locked in accordance with 110.25. The PV system disconnecting means shall be one of the following:</p> <ol style="list-style-type: none"> (1) A manually operable switch or circuit breaker. (2) A connector meeting the requirements of 690.33(D)(1) or (D)(5). (3) A pull-out switch with the required interrupting rating (4) A remote-controlled switch or circuit breaker that is operable locally and opens automatically when control power is interrupted. (5) A device listed or approved for the intended application. <p style="padding-left: 40px;">Informational Note: Circuit breakers marked “line” and “load” may not be suitable for backfed or reverse current.</p> <p><u>Where the PV system is interactive with other electric power production source(s), and the disconnect is a knife switch, then the PV system disconnect shall be of the heavy-duty type and shall comply with the requirements of 404.13(E) and 705.20.</u></p>	<p>“PV SYSTEM DISCONNECT” or equivalent. Additional markings shall be permitted based upon the specific system configuration. For PV system disconnecting means where the line and load terminals may be energized in the open position, the device shall be marked with the following words or equivalent:</p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;">ELECTRIC SHOCK HAZARD</p> <p style="text-align: center;">TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION</p> <p>The warning sign(s) or label(s) shall comply with 110.21(B).</p> <p>Δ (C) Maximum Number of Disconnects. Each PV system disconnecting means shall consist of not more than six switches or six sets of circuit breakers, or a combination of not more than six switches and sets of circuit breakers, mounted in a single enclosure, or in a group of separate enclosures. A single PV system disconnecting means shall be permitted for the combined ac output of one or more inverters or ac modules.</p> <p style="padding-left: 40px;">Informational Note: This requirement does not limit the number of PV systems connected to a service as permitted in 690.4(D). This requirement allows up to six disconnecting means to disconnect a single PV system. For PV systems where all power is converted through interactive inverters, a dedicated circuit breaker, in 705.12(B)(1), is an example of a single PV system disconnecting means.</p> <p>(D) Ratings. The PV system disconnecting means shall have ratings sufficient for the maximum circuit current, available fault current, and voltage that is available at the terminals of the PV system disconnect.</p> <p>(E) Type of Disconnect. The PV system disconnecting means shall simultaneously disconnect the PV system conductors that are not solidly grounded from all conductors of other wiring systems. The PV system disconnecting means or its remote operating device or the enclosure providing access to the disconnecting means shall be capable of being locked in accordance with 110.25. The PV system disconnecting means shall be one of the following:</p> <ol style="list-style-type: none"> (1) A manually operable switch or circuit breaker (2) A connector meeting the requirements of 690.33(D)(1) or (D)(3) (3) A pull-out switch with the required interrupting rating (4) A remote-controlled switch or circuit breaker that is operable locally and opens automatically when control power is interrupted (5) A device listed or approved for the intended application 	
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				<p>Informational Note: Circuit breakers marked “line” and “load” may not be suitable for backfeed or reverse current.</p> <p>Where the PV system is interactive with other electric power production source(s), and the disconnect is a knife switch, then the PV system disconnect shall be of the heavy duty type and shall comply with the requirements of 404.13(E) and 705.20.</p>	
(N)	695.3	Power Source(s) for Electric Motor-Driven Fire Pumps	<p>695.3 Power Sources for Electric Motor-Driven Fire Pumps. Electric motor-driven fire pumps shall have a reliable source of power.</p> <p>Informational Note: See Sections 9.3.2 and A.9.3.2 of NFPA 20-2019, <i>Standard for the Installation of Stationary Pumps for Fire Protection</i>, for guidance on the determination of power source reliability.</p> <p>(A) Individual Sources. Where reliable, and where capable of carrying indefinitely the sum of the locked rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply, the power source for an electric motor driven fire pump shall be one or more of the following.</p> <p>(1) Electric Utility Service Connection. A fire pump shall be permitted to be supplied by a separate service, or from a connection located ahead of and not within the same cabinet, enclosure, vertical switchgear section, or vertical switchboard section as the service disconnecting means. The connection shall be located and arranged so as to minimize the possibility of damage by fire from within the premises and from exposing hazards. A tap ahead of the service disconnecting means shall comply with 230.82(5). The service equipment shall comply with the labeling requirements in 230.2 and the location requirements in 230.72(B). [20:9.2.2(1)]</p> <p>(2) On-Site Power Production Facility. A fire pump shall be permitted to be supplied by an on-site power production facility. The source facility shall be located and protected to minimize the possibility of damage by fire. [20:9.2.2(3)]</p> <p>(3) Dedicated Feeder. A dedicated feeder shall be permitted where it is derived from a service connection as described in 695.3(A)(1). [20:9.2.2(3)]</p> <p>(B) Multiple Sources. If reliable power cannot be obtained from a source described in 695.3(A), power shall be supplied by one of the following: [20:9.3.2]</p> <p>(1) Individual Sources. An approved combination of two or more of the sources from 695.3(A).</p> <p>Δ (2) Individual Source and On-site Standby Generator. An approved combination of one or more of the sources in 695.3(A) and an on-site standby generator complying with 695.3(D). [20:9.3.4]</p> <p><i>Exception to 695.3(B)(1) and (B)(2): An alternate source of power shall not be required where a backup engine-driven fire pump, back-up steam turbine-driven fire pump, or back-up electric motor-driven fire pump with an independent power source in accordance with 695.3(A) or (C) is installed.</i></p> <p>Δ (C) Multibuilding Campus-Style Complexes. If the sources in 695.3(A) are not practicable and the installation is part of a multibuilding campus-style complex, feeder sources shall be permitted if approved by the authority having jurisdiction and installed in accordance with either 695.3(C)(1) and (C)(3) or (C)(2) and (C)(3).</p> <p>(1) Feeder Sources. Two or more feeders shall be permitted as more than one power source if such feeders are connected to, or derived from, separate utility services.</p>	<p>Δ 695.3 Power Source(s) for Electric Motor-Driven Fire Pumps. Electric motor-driven fire pumps shall have a reliable source of power.</p> <p>Informational Note: See NFPA 20-2019, <i>Standard for the Installation of Stationary Pumps for Fire Protection</i>, 9.3.2 and A.9.3.2, for guidance on the determination of power source reliability.</p> <p>(A) Individual Sources. Where reliable, and where capable of carrying indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply, the power source for an electric motor driven fire pump shall be one or more of the following.</p> <p>(1) Electric Utility Service Connection. A fire pump shall be permitted to be supplied by a separate service, or from a connection located ahead of and not within the same cabinet, enclosure, vertical switchgear section, or vertical switchboard section as the service disconnecting means. The connection shall be located and arranged so as to minimize the possibility of damage by fire from within the premises and from exposing hazards. A tap ahead of the service disconnecting means shall comply with 230.82(5). The service equipment shall comply with the labeling requirements in 230.2 and the location requirements in 230.72(B). [20:9.2.2(1)]</p> <p>(2) On-Site Power Production Facility. A fire pump shall be permitted to be supplied by an on-site power production facility. The source facility shall be located and protected to minimize the possibility of damage by fire. [20:9.2.2(3)]</p> <p>(3) Dedicated Feeder. A dedicated feeder shall be permitted where it is derived from a service connection as described in 695.3(A)(1). [20:9.2.2(3)]</p> <p>Informational Note: See NFPA 20-2019, <i>Standard for the Installation of Stationary Pumps for Fire Protection</i>, 9.2.2, for more information on normal power sources. Subsection 9.2.2(3) permits a “dedicated feeder” to be derived from a “dedicated service” disconnecting means. Subsection 9.2.2(5) permits a “dedicated transformer connection” that is supplied directly from a “dedicated service disconnecting means” where the service is not at utilization voltage.</p> <p>(B) Multiple Sources. If reliable power cannot be obtained from a source described in 695.3(A), power shall be supplied by one of the following: [20:9.3.2]</p> <p>(1) Individual Sources. An approved combination of two or more of the sources from 695.3(A).</p> <p>(2) Individual Source and On-site Standby Generator. An approved combination of one or more of the sources in 695.3(A) and an on-site standby generator complying with 695.3(D). [20:9.3.4]</p>	<p>Carry over 2020 SEC amendments and overlay on 2023 NEC. NEC adds an Informational note re: normal power sources and the standard for fire pumps.</p>

		<p>The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B)(1)(b).</p> <p>(2) Feeder and Alternate Source. A feeder shall be permitted as a normal source of power if an alternate source of power independent from the feeder is provided. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B)(1)(b).</p> <p>Δ (3) Selective Coordination. Overcurrent protective device(s) shall be selectively coordinated with all supply-side overcurrent protective device(s).</p> <p>Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, maintain, and operate the system.</p> <p><i>Exception 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.</i></p> <p><i>Exception 2: When an electrical engineer provides stamped fault current calculations, the overcurrent protective devices in each disconnecting means may be selectively coordinated with any other supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.</i></p> <p>Δ (D) On-Site Standby Generator as Alternate Source. An on-site standby generator(s) used as an alternate source of power shall comply with 695.3(D)(1) through (D)(3). [20:9.6.2.1]</p> <p>(1) Capacity. The generator shall have sufficient capacity to allow normal starting and running of the motor(s) driving the fire pump(s) while supplying all other simultaneously operated load(s). [20:9.6.1.1]</p> <p>Automatic shedding of one or more optional standby loads in order to comply with this capacity requirement shall be permitted.</p> <p>(2) Connection. A tap ahead of the generator disconnecting means shall not be required. [20:9.6.1.2]</p> <p>(3) Adjacent Disconnects. The requirements of 430.113 shall not apply.</p> <p>(E) Arrangement. All power supplies shall be located and arranged to protect against damage by fire from within the premises and exposing hazards. [20:9.1.4]</p> <p>Multiple power sources shall be arranged so that a fire at one source does not cause an interruption at the other source.</p> <p>(F) Transfer of Power. Transfer of power to the fire pump controller between the individual source and one alternate source shall take place within the pump room. [20:9.6.4]</p> <p>(H) Power Source Selection. Selection of power source shall be performed by a transfer switch listed for fire pump service. [20:10.8.1.3.1]</p> <p>(H) Overcurrent Device Selection. An instantaneous trip circuit breaker shall be permitted in lieu of the overcurrent devices specified in 695.4(B)(2)(a)(1), provided</p>	<p><i>Exception to 695.3(B)(1) and (B)(2): An alternate source of power shall not be required where a back-up engine-driven fire pump, back-up steam turbine-driven fire pump, or back-up electric motor-driven fire pump with an independent power source in accordance with 695.3(A) or (C) is installed.</i></p> <p>(C) Multibuilding Campus-Style Complexes. If the sources in 695.3(A) are not practicable and the installation is part of a multibuilding campus-style complex, feeder sources shall be permitted if approved by the authority having jurisdiction and installed in accordance with either 695.3(C)(1) and (C)(3) or (C)(2) and (C)(3).</p> <p>(1) Feeder Sources. Two or more feeders shall be permitted as more than one power source if such feeders are connected to, or derived from, separate utility services. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B)(1)(b).</p> <p>Δ (2) Feeder and Alternate Source. A feeder shall be permitted as a normal power source if an alternate power source independent from the feeder is provided. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B)(1)(b).</p> <p>(3) Selective Coordination. Overcurrent protective device(s) shall be selectively coordinated with all supply-side overcurrent protective device(s).</p> <p>Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, maintain, and operate the system.</p> <p><i>Exception 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.</i></p> <p><i>Exception 2: When an electrical engineer provides stamped fault current calculations, the overcurrent protective devices in each disconnecting means may be selectively coordinated with any other supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.</i></p> <p>(D) On-Site Standby Generator as Alternate Source. An on-site standby generator(s) used as an alternate source of power shall comply with 695.3(D)(1) through (D)(3). [20:9.6.2.1]</p> <p>(1) Capacity. The generator shall have sufficient capacity to allow normal starting and running of the motor(s) driving the fire pump(s) while supplying all other simultaneously operated load(s). [20:9.6.1.1]</p> <p>Automatic shedding of one or more optional standby loads in order to comply with this capacity requirement shall be permitted.</p>	
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		<p>that it is part of a transfer switch assembly listed for fire pump service that complies with 695.4(B)(2)(a)(2).</p> <p>(I) Phase Converters. Phase converters shall not be permitted to be used for fire pump service. [20:9.1.7]</p>	<p>(2) Connection. A tap ahead of the generator disconnecting means shall not be required. [20:9.6.1.2]</p> <p>(3) Adjacent Disconnects. The requirements of 430.113 shall not apply.</p> <p>(E) Arrangement. All power supplies shall be located and arranged to protect against damage by fire from within the premises and exposing hazards. [20:9.1.4] Multiple power sources shall be arranged so that a fire at one source does not cause an interruption at the other source.</p> <p>(F) Transfer of Power. Transfer of power to the fire pump controller between the individual source and one alternate source shall take place within the pump room. [20:9.6.4]</p> <p>(G) Power Source Selection. Selection of power source shall be performed by a transfer switch listed for fire pump service. [20:10.8.1.3.1]</p> <p>(H) Overcurrent Device Selection. An instantaneous trip circuit breaker shall be permitted in lieu of the overcurrent devices specified in 695.4(B)(2)(a)(1), provided that it is part of a transfer switch assembly listed for fire pump service that complies with 695.4(B)(2)(a)(2).</p> <p>(I) Phase Converters. Phase converters shall not be used to supply power to a fire pump. [20:9.1.7]</p>	
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