

CHAPTER 6
BUILDING SERVICES AND SYSTEMS
Double strike through denotes model language deleted by Oregon
Blue text denotes Oregon Amendments

603.3.1.1 Plan review. Plan review requirements for above-ground fuel oil tanks, See Section 5701.6.

604.1 Installation. Emergency and standby power systems required by this code or the *International Building Code* shall be installed in accordance with this code, NFPA110 and NFPA

111. Existing installations shall be maintained in accordance with the original approval.

Exception: Fuel supply requirements of NFPA 110, Section 5.1.2 may be reduced, when approved by the building official, based on the operational needs and of the facility served by the emergency or standby power system.

604.2.16 Group I-2 health care facilities. Automatic emergency and/or standby power supplies shall be provided for all health care facilities, as defined in NFPA 99. The approved alternative power supply shall maintain operating energy to the facility for a period of not less than 90 minutes. Emergency and standby power supplies shall be installed as required in the *Oregon Electrical Specialty Code* and in accordance with NFPA 99.

(renumber remaining sections)

~~604.2.18~~ **604.2.19 Elevators.** In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Sections ~~604.2.18.1~~ **604.2.19.1** through ~~604.2.18.4~~ **604.2.19.4**. **Elevators under standby power shall operate as required by ASME A17.1.**

~~604.2.18.3~~ **604.2.19.3 Two or more elevators.** Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time. Where the standby power source is not of sufficient capacity to operate all elevators at the same time, **the operation of all elevators shall comply with ASME A17.1.** ~~all elevators shall transfer to standby power in sequence, return to the designated landing and disconnect from the standby power source. After all elevators have been returned to the designated level, at least one elevator shall remain operable from the standby power source.~~

605.10 Portable, electric space heaters. Where not prohibited by other sections of this code, portable, electric space heaters shall be permitted to be used in all occupancies other than Group I-~~2~~ **and R-4** and in accordance with Sections 605.10.1 through 605.10.4.

Exception: The use of portable, electric space heaters ~~in which the heating element cannot exceed a temperature of 212°F (100°C)~~ shall be permitted in nonsleeping staff and employee areas in Group I-~~2~~ **and R-4** occupancies.

605.11 Building-mounted solar photovoltaic power systems. **See Oregon Solar Installation Specialty Code (OSISC) as adopted by OAR 918-800-0020.** ~~Solar photovoltaic power systems shall be installed in accordance with Sections 605.11.1 through 605.11.4, the *International Building Code* and NFPA 70.~~

Exception: ~~Detached, nonhabitable Group U structures including, but not limited to, parking shade structures, carports, solar trellises and similar structures shall not be subject to the requirements of this section.~~

605.11.1 Marking and labeling. ~~Marking and labeling as is required on interior and exterior direct current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects by the Oregon Electrical Specialty Code, Section 690.31 shall be maintained.~~

~~605.11.1.1 Materials. The materials used for marking shall be reflective, weather resistant and suitable for the environment. Marking as required in Sections 605.11.1.2 through 605.11.1.4 shall have all letters capitalized with a minimum height of 3/8 inch (9.5 mm) white on red background.~~

~~605.11.1.2 Marking content. The marking shall contain the words "WARNING: PHOTOVOLTAIC POWER SOURCE."~~

~~605.11.1.3 Main service disconnect. The marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated.~~

~~605.11.1.4 Location of marking. Marking shall be placed on interior and exterior DC conduit, raceways, enclosures and cable assemblies every 10 feet (3048 mm), within 1 foot (305 mm) of turns or bends and within 1 foot (305 mm) above and below penetrations of roof/ceiling assemblies, walls or barriers.~~

~~605.11.2 Locations of DC conductors. Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays. DC wiring shall be installed in metallic conduit or raceways, when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.~~

~~605.11.3 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 605.11.3.1 through 605.11.3.3.~~

~~Exceptions:~~

- ~~1. Residential structures shall be designed so that each photovoltaic array is no greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in either axis.~~
- ~~2. Panels/modules shall be permitted to be located up to the roof ridge where an alternative ventilation method approved by the fire chief has been provided or where the fire chief has determined vertical ventilation techniques will not be employed.~~

~~605.11.3.1 Roof access points. Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.~~

~~605.11.3.2 Residential systems for one and two family dwellings. Access to residential systems for one and two family dwellings shall be provided in accordance with Sections 605.11.3.2.1 through 605.11.3.2.4.~~

~~605.11.3.2.1 Residential buildings with hip roof layouts. Panels/modules installed on residential buildings with hip roof layouts shall be located in a manner that provides a 3-foot-wide (914 mm) clear access pathway from the eave to the ridge on each roof slope where panels/modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.~~

~~Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.~~

~~605.11.3.2.2 Residential buildings with a single ridge. Panels/modules installed on residential buildings with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels/modules are located.~~

~~Exception: This requirement shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.~~

~~605.11.3.2.3 Residential buildings with roof hips and valleys. Panels/modules installed on residential buildings with roof hips and valleys shall be located no closer than 18 inches (457 mm) to a hip or a valley where panels/modules are to be placed on both sides of a hip or valley. Where panels are to be located on only one side of a hip or valley that is of equal length, the panels shall be permitted to be placed directly adjacent to the hip or valley.~~

~~Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.~~

~~605.11.3.2.4 Residential building smoke ventilation. Panels/modules installed on residential buildings shall be located no higher than 3 feet (914 mm) below the ridge in order to allow for fire department smoke ventilation operations.~~

~~605.11.3.3 Other than residential buildings. Access to systems for occupancies other than one and two family dwellings shall be provided in accordance with Sections 605.11.3.3.1 through 605.11.3.3.3.~~

~~Exception: Where it is determined by the fire code official that the roof configuration is similar to that of a one or two family dwelling, the residential access and ventilation requirements in Sections 605.11.3.2.1 through 605.11.3.2.4 shall be permitted to be used.~~

~~605.11.3.3.1 Access. There shall be a minimum 6-foot-wide (1829 mm) clear perimeter around the edges of the roof.~~

~~Exception: Where either axis of the building is 250 feet (76 200 mm) or less, there shall be a minimum 4-foot-wide (1290 mm) clear perimeter around the edges of the roof.~~

~~605.11.3.3.2 Pathways. The solar installation shall be designed to provide designated pathways. The pathways shall meet the following requirements:~~

- ~~1. The pathway shall be over areas capable of supporting the live load of fire fighters accessing the roof.~~
- ~~2. The centerline axis pathways shall be provided in both axes of the roof. Centerline axis pathways shall run where the roof structure is capable of supporting the live load of fire fighters accessing the roof.~~
- ~~3. Shall be a straight line not less than 4 feet (1290 mm) clear to skylights or ventilation hatches.~~
- ~~4. Shall be a straight line not less than 4 feet (1290 mm) clear to roof standpipes.~~
- ~~5. Shall provide not less than 4 feet (1290 mm) clear around roof access hatch with at least one not less than 4 feet (1290 mm) clear pathway to parapet or roof edge.~~

~~605.11.3.3.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:~~

- ~~1. Arrays shall be no greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in distance in either axis in order to create opportunities for fire department smoke ventilation operations.~~
- ~~2. Smoke ventilation options between array sections shall be one of the following:
 - ~~2.1 A pathway 8 feet (2438 mm) or greater in width.~~~~

~~2.2 A 4 foot (1290 mm) or greater in width pathway and bordering roof skylights or smoke and heat vents.~~

~~2.3 A 4 foot (1290 mm) or greater in width pathway and bordering 4 foot by 8 foot (1290 mm by 2438 mm) "venting cutouts" every 20 feet (6096 mm) on alternating sides of the pathway.~~

~~605.11.4 Ground-mounted photovoltaic arrays. Ground-mounted photovoltaic arrays shall comply with Sections 605.11 through 605.11.2 and this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of 10 feet (3038 mm) shall be required for ground-mounted photovoltaic arrays.~~

605.12 Ground-mounted solar photovoltaic power systems. Ground-mounted solar photovoltaic power systems shall be installed in accordance with Sections 605.12.1 through 605.12.3 and NFPA 70.

605.12.1 Clearances. A clear, brush-free area of 10 feet (3038 mm) shall be required for ground-mounted photovoltaic arrays.

605.12.2 Non-combustible base. A gravel base or other non-combustible base acceptable to the fire code official shall be installed and maintained under and around the installation.

605.12.3 Security barriers. Fencing, skirting, or other suitable security barriers shall be installed when required by the fire code official.

606.9.1 Refrigeration system emergency shutoff. A clearly identified switch of the break-glass type or with an *approved* tamper-resistant cover shall provide off-only control of refrigerant compressors, refrigerant pumps and normally closed automatic refrigerant valves located ~~in the machinery room~~ **at an approved location immediately outside the machinery room and adjacent to its primary entrance.** Additionally, this equipment shall be automatically shut off whenever the refrigerant vapor concentration in the machinery room exceeds the vapor detector's upper detection limit or 25 percent of the LEL, which ever is lower.

608.1 Scope. **Flooded lead-acid, nickel cadmium and VLRA** stationary ~~S~~ storage battery systems ~~having an electrolyte capacity of more than 50 gallons (189 L) for flooded lead acid, nickel cadmium and VLRA,~~ **of greater than 7 batteries or over 600 amp-hour capacity,** or more than 1,000 pounds (454 kg) for lithiumion and lithium metal polymer, used for facility standby power, emergency power or uninterrupted power supplies shall comply with this section and Table 608.1. **Stationary storage battery systems shall not be located in a space with an open combustion source.**

[M] 609.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease vapors. **Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, A Type I or Type II hood shall be installed.**

Exception: Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.

[M] 609.2.1 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty and extra-heavy-duty cooking appliances.* Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke.

Exception: A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m³/s in accordance with Section 17 of UL 710B.

[M] 609.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other *approved* methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

[M] 609.2.1.2 Exhaust flow rate label. Type I hoods shall bear a label indicating the minimum flow rate in CFM per linear foot (1.55 L/s per linear meter) of hood that provides for capture and containment of the exhaust effluent for the cooking appliances served by the hood, based on the cooking appliances duty classifications defined in this code.

[M] 609.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all appliances that produce products of *combustion* and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00033 m³/s. For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m²). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 m³/(s · m²)].

[M] 609.2.3 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 609.2, 609.2.1 and 609.2.2.

Exception: A single domestic cooking appliance installed where domestic cooking operations occur, such as in a church, day-care center, fire station, employee lunchroom, or similar types of commercial occupancies shall meet the requirements of Section 505.1 of the *International Mechanical Code*.

[M] 609.2.4 Extra-heavy duty. Type I hoods for use over *extra-heavy-duty cooking appliances* shall not cover *heavy-, medium- or light-duty appliances*. Such hoods shall discharge to an exhaust system that is independent of other exhaust systems.

609.3 Operations and maintenance. Commercial cooking systems shall be operated and maintained in accordance with Sections 609.3.1 through 609.3.4 **and NFPA 96**.

610.2 Storage tanks. Cooking oil storage tanks shall be ~~listed in accordance with UL 142 or UL 80, and shall be~~ installed in accordance with Section 5704 and the tank manufacturer's instructions.