

RED Underlined = Existing Oregon Amendment brought forward from the 2007 OFC

BLUE or ~~BLUE Strikethrough~~ = Oregon Deletion or NOT ADPOTED

TEAL Underlined = New Oregon Amendment in the 2010 OFC

PLUM Underlined or ~~Strikethrough~~ = Oregon Mid Cycle Amendments

CHAPTER 9

FIRE PROTECTION SYSTEMS

902.1 Definitions.

SUBSTANTIAL ALTERATION. For the purpose of Section 903.2.8.1 is any alteration where the total cost of all alterations (including but not limited to electrical, mechanical, plumbing and structural changes) for a building or facility within any 12-month period amounts to 25 percent or more of the assessed value of the structure before the alterations occurred. For the purpose of Section 903.2.8.1, standard building maintenance, rewiring, re-siding or re-roofing are not considered as alterations.

SUBSTANTIAL DAMAGE. For the purpose of Section 903.2.8.1 is any damage of any origin to a structure whereby the cost of restoring the structure to its original condition would be equal to or exceed 25 percent of the assessed value of the structure before the damage occurred.

903.1.1 Alternate protection. Alternative automatic fire-extinguishing systems complying with Section 904 shall be permitted in lieu of automatic sprinkler protection where recognized by the applicable standard and approved by the **fire building** code official.

903.2.7 Group M. An automatic sprinkler system shall be provided throughout buildings containing a group M occupancy where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (115 m²).
2. A Group M fire area is located more than three stories above grade level.
3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
- ~~4. A Group M occupancy is used for the display and sale of upholstered furniture.~~

903.2.8.1 Requirement. Where substantial alterations are made or substantial damage occurs to an existing nonsprinkled Group R2 apartment house, designed and constructed under the provisions of the Oregon Structural Specialty Code, an approved automatic sprinkler system complying with NFPA 13R shall be installed only in the substantially altered or damaged dwelling units. When more than 50 percent of the dwelling units within a building are substantially altered or damaged, the entire apartment house occupancy shall be provided with an NFPA 13R sprinkler system or equivalent.

For the purpose of this section, when NFPA 13R sprinkler system is installed, a fire department connection shall not be required.

903.3.1.1.1 Exempt locations. Automatic sprinklers shall not be required in the following rooms and areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the **fire building** code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. In rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevator machine rooms and machinery spaces.

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction, ~~provided there is a roof or deck above~~. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joint construction.

903.4.1 Monitoring . Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved supervising station or when approved by the **fire building** code official, shall sound an audible signal at a constantly attended location.

Exceptions:

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electronically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

904.2 Where required. Automatic fire-extinguishing systems installed as an alternative to the required automatic sprinkler systems of Section 903 shall be approved by the **fire building** code official. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed by other requirements of this code.

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise approved by the fire code official.
2. On each side of the wall adjacent to the exit opening of a horizontal exit.
Exception: Where floor areas adjacent to a horizontal exit are reachable from the exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30480 mm) of hose, a hose connection shall not be required at the horizontal exit.
3. In every exit passageway, at the entrance from the exit passageway to other areas of a building.
Exception: Where floor areas adjacent to an exit passageway are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.
4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall.

5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), each standpipe shall be provided with a hose connection located either on the roof or at the highest landing of a stairway with stair access to the roof. An additional hose connection shall be provided at the top of the most hydraulically remote standpipe for testing purposes.
6. Where the most remote portion of a nonsprinkled floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinkled floor or story is more than 200 feet (60 960 mm) from a hose connection, the ~~fire~~ **building** code official is authorized to require that additional hose connections be provided in approved locations.

905.5.3 Class II system 1-inch hose. A minimum 1-inch (25 mm) hose shall be allowed to be used for hose stations in light-hazard occupancies where investigated and listed for this service and where approved by the ~~fire~~ **building** code official.

906.1 Where required. Portable fire extinguishers shall be installed in the following locations.

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

~~Exception: In new and existing Group A, B and E occupancies equipped throughout with quick response sprinklers, portable fire extinguishers shall be required only in locations specified in items 2 through 6. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10B-C.~~

2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 1415.1.
5. Where required by the sections indicated in table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms

907.2.6 Group I. A manual **and automatic** fire alarm system that activates the occupant notification system shall be installed in Group I occupancies. ~~An automatic smoke detection system that activates the occupant notification system shall be provided in accordance with Sections 907.2.6.1 and 907.2.6.3.3.~~

Exception:

- ~~1. Manual fire alarm boxes in resident or patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.~~
- ~~2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official.~~

907.2.6.2 Group I-2. ~~An automatic smoke detection system shall be installed in corridors in nursing homes (both intermediate care and skilled nursing facilities), detoxification facilities and spaces permitted to be open to the corridors by Section 407.2 of the *International Building Code*. The system shall activate in accordance with Section 907.6.~~ Hospitals shall be equipped with smoke detection as required in Section 407.2 of the *International Building Code*. **Supervised smoke detectors that comply with UL 268 shall be provided in corridors, sleeping rooms and spaces open to the corridors.**

Exceptions:

1. ~~Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where such units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each patient sleeping unit and shall provide an audible and visual alarm at the nursing station attending each unit.~~
2. Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where patient sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors ~~on the unit sides~~ installed in accordance with their listing, provided that the integral detectors **shall be supervised and** perform the required alerting function **in an approved manner**.

907.2.6.2.1 Annunciation. Smoke detectors in patient sleeping rooms of Group I-2 occupancies shall provide a visual display on the corridor side of each patient sleeping unit and an audible and visual alarm at the nursing station attending each unit.

907.2.11 Single- and multiple-station smoke alarms. Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.4 and NFPA 72.

Note: Readers should also consult the Oregon smoke detection law located in ORS 479.250 through 479.300.

907.6.2.3.3 Groups I-1, and R-1 and R-4. Group I-1, and R-1 and R-4 dwelling units or sleeping units ~~in accordance with Table 907.6.2.3~~ shall be provided with a visible alarm notification appliance, activated by both the in room smoke alarm and the building fire alarm system **in accordance with Chapter 11 of the Oregon Structural Specialty Code and NFPA 72.**

**TABLE 907.6.2.3
VISIBLE ALARMS**

<u>NUMBER OF SLEEPING UNITS</u>	<u>SLEEPING ACCOMMODATIONS WITH VISIBLE AND AUDIBLE ALARMS</u>
6 TO 25	2
26 TO 50	4
51 TO 75	7
76 TO 100	9
101 TO 150	12
151 TO 200	14
201 TO 300	17
301 TO 400	20
401 TO 500	22
501 TO 1,000	5% OF TOTAL
1,001 AND OVER	50 PLUS 3 FOR EACH 100 OVER 1,000

907.6.2.3.4 Group R-2. Group R-2 occupancies required by Section 907 to have a fire alarm system, ~~all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1~~ **visual alarms shall be provided within common and public use areas, but are not required within individual adaptable dwelling units. See Section 1110.10 of the Oregon Structural Specialty Code,**

Section 908.7 effective April 1, 2011

908.7 Carbon monoxide alarms. For new construction, approved single station carbon monoxide alarms or a household carbon monoxide detection system shall be installed in each of the following occupancies:

1. Group R occupancies identified in 310 of the International Building Code, and
2. Groups SR-3 and SR-4 occupancies identified in Appendix SR of the International Building Code.

908.7.1 Installation location. Carbon monoxide alarms shall be located in each bedroom or within 15 feet outside of each bedroom door. Bedrooms on separate floor levels in a structure consisting of two or more stories shall have separate carbon monoxide alarms serving each story.

908.7.1.2 Three or more dwelling units. In addition to the locations required by Section 908.7.1, a carbon monoxide alarm shall be installed in any enclosed common areas within buildings containing three or more dwelling units.

908.7.2 Alarm requirements.

908.7.2.1 Single station alarm requirements. Single station carbon monoxide alarms shall be listed as complying with ANSI/UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

908.7.2.2 Household carbon monoxide detection systems. Household carbon monoxide detection systems, that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with ANSI/UL 2075.

908.7.2.3 Combination smoke/carbon monoxide alarm/detector requirements. Combination smoke/carbon monoxide alarms shall be listed as complying with ANSI/UL 2034 and ANSI/UL 217. Combination smoke/carbon monoxide detectors shall be listed as complying with ANSI/UL 2075 and ANSI/UL 268. See Section 907.2.11 of this code for additional requirements specific to the installation of smoke alarms.

908.7.3 Power source.

908.7.3.1 Carbon monoxide alarms. Single station carbon monoxide alarms shall be battery operated, or may receive their primary power from the building wiring system. Plug in devices securely fastened to the structure and installed in accordance with the manufacturer's installation instructions are deemed to satisfy this requirement. Hard wired and plug in carbon monoxide alarms shall be equipped with battery back up.

908.7.3.2 Household carbon monoxide detection systems. Required power supply sources for household carbon monoxide detection systems shall be in accordance with NFPA 720.

908.7.3.3 Combination smoke/carbon monoxide alarms/detectors. Combination smoke/carbon monoxide alarms/detectors shall receive their power source in accordance with Section 907.2.11.4 and NFPA 72. Smoke alarm features of combination smoke/carbon monoxide alarms shall be interconnected.

Exception: Interconnection and hard-wiring of combination smoke/carbon monoxide alarms/detectors in existing areas shall not be required where the alterations or

repairs do not result in the removal of interior wall or ceiling finishes exposing the structure.

908.7.4 Where required in existing affected occupancies. Where a new carbon monoxide source is introduced or work requiring a structural permit occurs in existing occupancies as identified in Section 908.1, carbon monoxide alarms shall be provided in accordance with section 908.7 of this code.

Exception: Work involving the exterior surfaces of affected occupancies, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, are exempt from the requirements of this section.

908.7.5 Testing and maintenance. Carbon monoxide alarms and systems shall be maintained and tested in accordance with NFPA 720 and the manufacturer's instructions.

909.5.1 Leakage area. Total leakage area of the barrier is the product of the smoke barrier gross area multiplied by the allowable leakage area ratio, plus the area of other openings such as gaps and operable windows. Compliance shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems. Passive smoke control systems tested using other approved means, such as door fan testing, shall be as approved by the [fire building](#) code official.

909.7 Airflow design method. When approved by the [fire building](#) code official, smoke migration through openings fixed in a permanently open position, which are located between smoke-control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects.

909.8 Exhaust method. When approved by the [fire building](#) code official, mechanical smoke control for large enclosed volumes, such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92B.

909.9 Design fire. The design fire shall be based on a rational analysis performed by the registered design professional and approved by the [fire building](#) code official. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

909.10 Equipment. Equipment including, but not limited to, fans, ducts, automatic dampers and balance dampers shall be suitable for their intended use, suitable for the probable exposure temperatures that the rational analysis indicates, and as approved by the [fire building](#) code official.

909.15 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with the [fire building](#) official, the fire department and in the fire command center in a format and manner approved by the fire chief.

909.18.8.3.1 Report filling. A copy of the final report shall be filed with the [fire building](#) code official and an identical copy shall be maintained in an approved location at the building.

909.19 System acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the [fire building](#) code official

determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as approved by the **fire building** code official, shall be allowed, provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

910.4 Mechanical smoke exhaust. Where approved by the **fire building** code official, engineered mechanical smoke exhaust shall be an acceptable alternative to smoke and heat vents.

914.8.2 Fire Suppression. Aircraft hangers shall be provided with a fire suppression system designed in accordance with NFPA 409, based upon the classification for the hanger given in Table 914.8.2.

Exceptions:

- 1. When a fixed based operator has separate repair facilities on site, Group II hanger operated by a fixed base operator used for storage of transient aircraft only shall have a fire suppression system, but the system shall be exempt from foam requirements.**
- 2. Aircraft hangers that have an aircraft access door height less than 28 feet (8534 mm), and do not have provisions for housing aircraft with a tail height over 28 Feet (8534 mm), are exempt from foam requirements provided the building complies with all the following criteria:**
 - 2.1 The building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.**
 - 2.2 The building is provided with an automatic sprinkler system throughout with a design density of 0.25 gal/min. (0.016 L/s).**
 - 2.3 The total fuel capacity of all aircraft located within a single fire area does not exceed 5,000 gallons (18 927 L).**
 - 2.4 No single fire area exceeds 65,000 square feet (3716 m²).**
 - 2.5 The gross building area does not exceed 75,000 square feet (4288 m²).**