

CHAPTER 9

FIRE PROTECTION SYSTEMS

902.1 Definitions.

PIER. A structure, usually of greater length than width and projecting from shore into a body of water with direct access from land that can be either open deck or provided with a superstructure.

SUBSTANTIAL ALTERATION. For the purpose of Section 903.2.7.2 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 40 25 percent or more of the assessed value of the structure before the alterations occurred. For the purpose of Section 903.2.7.2 standard building maintenance, rewiring, re-siding or re-roofing are not considered as alterations.

SUBSTANTIAL DAMAGE. For the purpose of Section 903.2.7.2 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 40 25 percent of the assessed value of the structure before the damage occurred.

WHARF. A structure at the shoreline, having a platform built along side and parallel to a body of water that may have an open deck or provided with a superstructure.

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 ~~fire~~ **building** code official.

~~**903.2.7.1 Alternate fire sprinkler system requirements.** The requirements of Section 903.2.7.2 are adopted by the Building Codes Division of the State of Oregon for optional use in municipalities.~~

~~**NOTE:** “for optional use in municipalities” means when included in the local building department adoption ordinance of the Oregon Structural Specialty Code.~~

~~**903.2.7.2 903.2.7.1 Requirement.** Where substantial alterations are made or substantial damage occurs to an existing non-sprinkled Group R2 apartment buildings designed and constructed under the provisions of the Oregon Structural Specialty Code, an approved automatic multipurpose sprinkler system complying with NFPA 13D 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 Group R Occupancy apartment house shall be provided with an NFPA-13D13R 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.~~

903.2.9 Group S-2. An automatic sprinkler system shall be provided throughout buildings classified as **all** enclosed parking garages in accordance with Section 406.4 of the *International Building Code* or where located beneath other groups **one of the following conditions exist.**

- 1. A Group S-2 enclosed parking garage fire area exceeds 12, 000 square feet (1115 m²).**
- 2. The Group S-2 enclosed parking garage is located beneath other groups.**

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

903.2.10 Piers or wharves, and ~~W~~ windowless stories in all occupancies. An automatic sprinkler system shall be installed in the locations set forth in Sections 903.2.10.1 through 903.2.10.1.3 **and 903.2.10.4.**

Exception: Group R-3 and Group U.

903.2.10.4 Piers or wharves. An automatic sprinkler system shall be installed under piers or wharves as required per NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers and Wharves.

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.

903.4.1 Signals. Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved central station, remote supervising station or proprietary supervising station as defined in NFPA 72 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.
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.

905.5.1.1 Group A occupancies with an occupant load exceeding 1,000. In Group A occupancies with an occupant load exceeding 1,000, Class II standpipe hose connections shall be provided where process or conditions exist that would nullify the effectiveness of the automatic sprinkler system.

905.5.1.2 Groups I, H, B, S, M and F, Division 1 occupancies less than four stories in height, but greater than 20,000 square feet per floor. In Groups I; H; B; S; M; F, Division 1 occupancies less than four stories in height, but greater than 20,000 square feet (1858 m²) per floor, Class II standpipe hose connections shall be provided where process or conditions exist which would nullify the effectiveness of the automatic sprinkler system.

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.

907.2.6 Group I. A manual **and automatic** fire alarm system shall be installed in Group I occupancies. ~~An electrically supervised, automatic smoke detection system shall be provided in accordance with Sections 907.2.6.1 and 907.2.6.2.~~

Exception: 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 907.3.1 are not exceeded.

~~**907.2.6.2 Group I-2.** 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* shall be equipped with an automatic fire detection system. 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 rooms where patient sleeping 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.

907.2.10 Single- and multiple-station smoke alarms. Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with the provisions of this code and the household fire-warning equipment provisions of NFPA 72.

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

907.3.1.2 Group I-1. A fire alarm system shall be installed in existing group I-1 residential care/assisted living facilities **in accordance with Section 907.2.6.**

Exception: ~~Where each sleeping room has a means of egress door opening directly to an exterior egress balcony that leads directly to the exits in accordance with Section 1014.5 and the building is not more than three stories in height.~~

907.3.1.8 Group R-4. A fire alarm system shall be installed in existing Group R-4 residential care/assisted living facilities **in accordance with Section 907.2.6.**

Exceptions:

1. ~~Where there are interconnected smoke alarms meeting the requirements of Section 907.2.10 and there is at least one manual fire alarm box per floor arranged to sound continuously the smoke alarms.~~
2. ~~Other manually activated, continuously sounding alarms approved by the fire code official.~~

907.10.1 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.10.1.1 through 907.10.1.4 **Chapter 11 of the Oregon Structural Specialty Code and NFPA 72.**

Exceptions:

1. ~~Visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.~~
2. ~~Visible alarm notification appliances shall not be required in exits as defined in Section 1002.1.~~

907.10.1.3 Groups I-1, and R-1 and R-4. Group I-1, ~~and R-1~~ **and R-4** sleeping units ~~in accordance with Table 907.10.1.3~~ 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 907.10.1.3

VISIBLE AND AUDIBLE ALARMS

NUMBER OF SLEEPING UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE AND AUDIBLE ALARMS
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

907.10.1.4 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 **Oregon Structural Specialty Code, Section 1110.10.**

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.

909.18.8.3.1 Report filing. 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 fire suppression as required by NFPA 409.

Exceptions:

1. Group II hangers, as defined in NFPA 409, storing private aircraft without major maintenance or overhaul are exempted from foam suppression requirements.

2. **Group I hangers as defined in NFPA 409 which exceed 40,000 ft² (3716 m²), but have an aircraft access door height less than 28 feet (8.5 m), and do not have provision for housing aircraft with a tail height over 28 feet (8.5 m), and without major maintenance or overhaul, are exempt from foam suppression requirements if they have automatic fire sprinkler protection with a density of 0.25 gal/min (0.946 l/m).**