CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

User note:

About this chapter: Chapter 9 *prescribes the minimum requirements for active fire protection equipment systems to perform the functions of detecting a fire, alerting the occupants or fire department of a fire emergency, mass notification, gas detection, controlling smoke and controlling or extinguishing the fire. Generally, the requirements are based on the occupancy, the height and the area of the building, because these are the factors that most affect fire-fighting capabilities and the relative hazard of a specific building or portion thereof. This chapter parallels and is substantially duplicated in* Chapter 9 *of the* International Building Code®; *however, this chapter also contains periodic testing criteria that are not contained in the* International Building Code. *In addition, the special fire protection system requirements based on use and occupancy found in* Chapter 4 *of the* International Building Code *are duplicated in this chapter as a user convenience.*

SECTION 901 GENERAL

901.1 Scope.

The provisions of this chapter shall specify where fire protection and life safety systems are required and shall apply to the design, installation, inspection, operation, testing and maintenance of all *fire protection systems*.

901.2 Construction documents.

The *fire code official* shall have the authority to require *construction documents* and calculations for all *fire protection systems* and to require permits be issued for the installation, rehabilitation or modification of any *fire protection system*. *Construction documents* for *fire protection systems* shall be submitted for review and approval prior to system installation.

901.2.1 Statement of compliance.

Before requesting final approval of the installation, where required by the *fire code official*, the installing contractor shall furnish a written statement to the *fire code official* that the subject *fire protection system* has been installed in accordance with *approved* plans and has been tested in accordance with the manufacturer's specifications and the appropriate installation standard. Any deviations from the design standards shall be noted and copies of the approvals for such deviations shall be attached to the written statement.

901.3 Permits.

Permits shall be required as set forth in Sections 105.6 and 105.7.

901.4 Installation.

Fire protection systems shall be maintained in accordance with the original installation standards for that system. Required systems shall be extended, altered or augmented as necessary to maintain and continue protection where the building is altered, remodeled or added to. *Alterations* to *fire protection systems* shall be done in accordance with applicable standards.

901.4.1 Required fire protection systems.

Fire protection systems required by this code or the *International Building Code* shall be installed, repaired, operated, tested and maintained in accordance with this code. A *fire protection system* for which a design option, exception or reduction to the provisions of this code or the *International Building Code* has been granted shall be considered to be a required system.

901.4.2 Nonrequired fire protection systems.

A *fire protection system* or portion thereof not required by this code or the *International Building Code* shall be allowed to be furnished for partial or complete protection provided that such installed system meets the applicable requirements of this code and the *International Building Code*.

901.4.3 Fire areas.

Where buildings, or portions thereof, are divided into *fire areas* so as not to exceed the limits established for requiring a *fire protection system* in accordance with this chapter, such *fire areas* shall be separated by *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both, having a fire-resistance rating of not less than that determined in accordance with Section 707.3.10 of the *International Building Code*.

901.4.4 Additional fire protection systems.

In occupancies of a hazardous nature, where special hazards exist in addition to the normal hazards of the occupancy, or where the *fire code official* determines that access for fire apparatus is unduly difficult, the *fire code official* shall have the authority to require additional safeguards. Such safeguards include, but shall not be limited to, the following: automatic fire detection systems, fire alarm systems, automatic fire-extinguishing systems, standpipe systems, or portable or fixed extinguishers. Fire protection equipment required under this section shall be installed in accordance with this code and the applicable referenced standards.

901.4.5 Appearance of equipment.

Any device that has the physical appearance of life safety or fire protection equipment but that does not perform that life safety or fire protection function shall be prohibited.

901.4.6 Pump and riser room size.

Where provided, fire pump rooms and *automatic sprinkler system* riser rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working space around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without

removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump and *automatic sprinkler system* riser rooms shall be provided with doors and unobstructed passageways large enough to allow removal of the largest piece of equipment.

901.4.6.1 Access.

Automatic sprinkler system risers, fire pumps and controllers shall be provided with ready access. Where located in a fire pump room or automatic sprinkler system riser room, the door shall be permitted to be locked provided that the key is available at all times.

901.4.6.2 Marking on access doors.

Access doors for automatic sprinkler system riser rooms and fire pump rooms shall be labeled with an approved sign. The lettering shall be in contrasting color to the background. Letters shall have a minimum height of 2 inches (51 mm) with a minimum stroke of $^3/_8$ inch (10 mm).

901.4.6.3 Environment.

Automatic sprinkler system riser rooms and fire pump rooms shall be maintained at a temperature of not less than 40°F (4°C). Heating units shall be permanently installed.

901.4.6.4 Lighting.

Permanently installed artificial illumination shall be provided in the automatic sprinkler system riser rooms and fire pump rooms.

901.5 Installation acceptance testing.

Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains and all other *fire protection systems* and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as *approved* by the *fire code official*. The *fire code official* shall be notified before any required acceptance testing.

901.5.1 Occupancy.

It shall be unlawful to occupy any portion of a building or structure until the required fire detection, alarm and suppression systems have been tested and *approved*.

901.6 Inspection, testing and maintenance.

Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire-extinguishing systems, mechanical smoke exhaust systems and smoke and heat vents shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection systems* and equipment shall be inspected, tested and maintained or removed.

901.6.1 Standards.

Fire protection systems shall be inspected, tested and maintained in accordance with the referenced standards *listed* in Table 901.6.1.

Exception: Fire alarm and water-based automatic fireextinguishing systems shall be inspected and tested annually. Inspections and testing shall be conducted in accordance with the procedures specified in the referenced standards listed in Table 901.6.1. As part of the annual inspections covered under this exception, all weekly, monthly, quarterly, semiannual, and annual inspections, tests, and maintenance requirements in the listed standards shall be conducted and any problems observed shall be noted.

TABLE 901.6.1
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing system	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001
Aerosol fire-extinguishing systems	NFPA 2010

901.6.2 Integrated testing.

Where two or more fire protection or life safety systems are interconnected, the intended response of subordinate fire protection and life safety systems shall be verified when required testing of the initiating system is conducted. In addition, integrated testing shall be performed in accordance with Sections 901.6.2.1 and 901.6.2.2.

901.6.2.1 High-rise buildings.

For high-rise buildings, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire protection or life safety functions that are initiated by equipment that was repaired or replaced.

901.6.2.2 Smoke control systems.

Where a fire alarm system is integrated with a smoke control system as outlined in Section 909, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire protection or life safety functions that are initiated by equipment that was repaired or replaced.

901.6.3 Records.

Records of all system inspections, tests and maintenance required by the referenced standards shall be maintained.

901.6.3.1 Records information.

Initial records shall include the name of the installation contractor, type of components installed, manufacturer of the components, location and number of components installed per floor. Records shall include the manufacturers' operation and maintenance instruction manuals. Such records shall be maintained for the life of the installation.

901.7 Systems out of service.

Where a required *fire protection system* is out of service, the fire department and the *fire code official* shall be notified immediately and, where required by the *fire code official*, the building shall be either evacuated or an *approved* fire watch shall be provided for all occupants left unprotected by the shutdown until the *fire protection system* has been returned to service.

Where utilized, fire watches shall be provided with not less than one *approved* means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

901.7.1 Impairment coordinator.

The building *owner* shall assign an impairment coordinator to comply with the requirements of this section. In the absence of a specific designee, the *owner* shall be considered to be the impairment coordinator.

901.7.2 Tag required.

A tag shall be used to indicate that a system, or portion thereof, has been removed from service.

901.7.3 Placement of tag.

The tag shall be posted at each fire department connection, system control valve, fire alarm control unit, fire alarm annunciator and *fire command center*, indicating which system, or part thereof, has been removed from service. The *fire code official* shall specify where the tag is to be placed.

901.7.4 Preplanned impairment programs.

Preplanned impairments shall be authorized by the impairment coordinator. Before authorization is given, a designated individual shall be responsible for verifying that all of the following procedures have been implemented:

1. The extent and expected duration of the impairment have been determined.
2. The areas or buildings involved have been inspected and the increased risks determined.
3. Recommendations have been submitted to management or the building *owner*/manager.
4. The fire department has been notified.
5. The insurance carrier, the alarm company, the building *owner*/manager and other authorities having jurisdiction have been notified.
6. The supervisors in the areas to be affected have been notified.
7. A tag impairment system has been implemented.
8. Necessary tools and materials have been assembled on the impairment site.

901.7.5 Emergency impairments.

Where unplanned impairments occur, appropriate emergency action shall be taken to minimize potential injury and

damage. The impairment coordinator shall implement the steps outlined in Section 901.7.4.

901.7.6 Restoring systems to service.

Where impaired equipment is restored to normal working order, the impairment coordinator shall verify that all of the following procedures have been implemented:

1. Necessary inspections and tests have been conducted to verify that affected systems are operational.
2. Supervisors have been advised that protection is restored.
3. The fire department has been advised that protection is restored.
4. The building *owner*/manager, insurance carrier, alarm company and other involved parties have been advised that protection is restored.
5. The impairment tag has been removed.

901.8 Removal of or tampering with equipment.

It shall be unlawful for any person to remove, tamper with or otherwise disturb any fire hydrant, fire detection and alarm system, fire suppression system or other fire appliance required by this code except for the purposes of extinguishing fire, training, recharging or making necessary repairs or where *approved* by the *fire code official*.

901.8.1 Removal of or tampering with appurtenances.

Locks, gates, doors, barricades, chains, enclosures, signs, tags or seals that have been installed by or at the direction of the *fire code official* shall not be removed, unlocked, destroyed, tampered with or otherwise vandalized in any manner.

901.8.2 Removal of existing occupant-use hose lines.

The *fire code official* is authorized to permit the removal of existing occupant-use hose lines where both of the following conditions exist:

1. The hose line would not be utilized by trained personnel or the fire department.
2. The remaining outlets are compatible with local fire department fittings.

901.9 Termination of monitoring service.

For fire alarm systems required to be monitored by this code, notice shall be made to the *fire code official* whenever alarm monitoring services are terminated. Notice shall be made in writing by the provider of the monitoring service being terminated.

901.10 Recall of fire protection components.

Any *fire protection system* component regulated by this code that is the subject of a voluntary or mandatory recall under federal law shall be replaced with *approved*, *listed* components in compliance with the referenced standards of this code. The *fire code official* shall be notified in writing by the building *owner* when the recalled component parts have been replaced.

901.11 Fire sprinklers and fire detectors—ceilings.

In buildings protected by automatic sprinklers or automatic fire detectors, suspended or removable ceiling tiles shall be maintained in place to prevent the delay in sprinkler or detector activation.

Exception: When additional sprinklers or detectors are installed in the space above the suspended ceiling.

901.11.1 Open-grid ceilings.

Open-grid ceilings shall not be installed beneath sprinklers.

Exception: Open-grid ceilings are allowed when the requirements of NFPA 13 for open-grid ceilings are met.

901.11.2 Drop-out ceilings.

Drop-out ceilings shall be permitted to be installed beneath sprinklers when all requirements of NFPA 13 for drop-out ceilings have been met.

SECTION 902 DEFINITIONS

902.1 Definitions.

The following terms are defined in Chapter 2:

ALARM NOTIFICATION APPLIANCE.

ALARM SIGNAL.

ALARM VERIFICATION FEATURE.

ANNUNCIATOR.

AUDIBLE ALARM NOTIFICATION APPLIANCE.

AUTOMATIC.

AUTOMATIC FIRE-EXTINGUISHING SYSTEM.

AUTOMATIC SMOKE DETECTION SYSTEM.

AUTOMATIC SPRINKLER SYSTEM.

AUTOMATIC WATER MIST SYSTEM.

AVERAGE AMBIENT SOUND LEVEL.

CARBON DIOXIDE EXTINGUISHING SYSTEM.

CLEAN AGENT.

COMMERCIAL MOTOR VEHICLE.

CONSTANTLY ATTENDED LOCATION.

DELUGE SYSTEM.

DETECTOR, HEAT.

DRY-CHEMICAL EXTINGUISHING AGENT.

ELEVATOR GROUP.

EMERGENCY ALARM SYSTEM.

EMERGENCY VOICE/ALARM COMMUNICATIONS.

FIRE ALARM BOX, MANUAL.

FIRE ALARM CONTROL UNIT.

FIRE ALARM SIGNAL.

FIRE ALARM SYSTEM.

FIRE AREA.

FIRE DETECTOR, AUTOMATIC.

FIRE PROTECTION SYSTEM.

FIRE SAFETY FUNCTIONS.

FIXED BASE OPERATOR (FBO).

FOAM-EXTINGUISHING SYSTEM.

GAS DETECTION SYSTEM.

HALOGENATED EXTINGUISHING SYSTEM.

IMPAIRMENT COORDINATOR.

INITIATING DEVICE.

MANUAL FIRE ALARM BOX.

MULTIPLE-STATION ALARM DEVICE.

MULTIPLE-STATION SMOKE ALARM.

NOTIFICATION ZONE.

NUISANCE ALARM.

PRIVATE GARAGE.

RECORD DRAWINGS.

SINGLE-STATION SMOKE ALARM.

SLEEPING UNIT.

SMOKE ALARM.

SMOKE DETECTOR.

STANDPIPE, TYPES OF.

- **Automatic dry.**
- **Automatic wet.**
- **Manual dry.**
- **Manual wet.**
- **Semiautomatic dry.**

STANDPIPE SYSTEM, CLASSES OF.

- **Class I system.**
- **Class II system.**

SUPERVISING STATION.

SUPERVISORY SERVICE.

SUPERVISORY SIGNAL.

SUPERVISORY SIGNAL-INITIATING DEVICE.

TIRES, BULK STORAGE OF.

TRANSIENT AIRCRAFT.

TROUBLE SIGNAL.

VISIBLE ALARM NOTIFICATION APPLIANCE.

WET-CHEMICAL EXTINGUISHING AGENT.

WIRELESS PROTECTION SYSTEM.

ZONE.

ZONE, NOTIFICATION.

SECTION 903
AUTOMATIC SPRINKLER SYSTEMS

903.1 General.

Automatic sprinkler systems shall comply with this section.

903.1.1 Alternative protection.

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

903.2 Where required.

Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

Exception: Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

903.2.1 Group A.

A n *automatic sprinkler system* shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section.

903.2.1.1 Group A-1.

A n *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
4. The *fire area* contains a multiple-theater complex.

903.2.1.2 Group A-2.

A n *automatic sprinkler system* shall be provided throughout stories containing Group A-2 occupancies and throughout all stories from the Group A-2 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 5,000 square feet (464 m^2).
2. The *fire area* has an *occupant load* of 100 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.3 Group A-3.

A n *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.4 Group A-4.

A n *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.5 Group A-5.

A n *automatic sprinkler system* shall be provided for all enclosed Group A-5 accessory use areas in excess of 1,000 square feet (93 m^2).

903.2.1.5.1 Spaces under grandstands or bleachers.

Enclosed spaces under *grandstands* or *bleachers* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where either of the following exist:

1. The enclosed area is 1,000 square feet (93 m^2) or less and is not constructed in accordance with Section 1029.1.1.1.
2. The enclosed area exceeds 1,000 square feet (93 m^2).

903.2.1.6 Assembly occupancies on roofs.

Where an occupied roof has an assembly occupancy with an *occupant load* exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the occupied roof and the *level of exit discharge* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

903.2.1.7 Multiple fire areas.

An *automatic sprinkler system* shall be provided where multiple fire areas of Group A-1, A-2, A-3 or A-4 occupancies share exit or *exit access* components and the combined *occupant load* of these fire areas is 300 or more.

903.2.2 Ambulatory care facilities.

An *automatic sprinkler system* shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation.
2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit* discharge, and all floors below the *level of exit discharge*.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

903.2.3 Group E.

An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 12,000 square feet (1,115 m^2) in area.
2. Whenever the Group E fire area is located on a floor other than a level of exit discharge serving such occupancies.

   Exception: In buildings where every classroom has not fewer than one exterior exit door at a level of exit discharge, an automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area.
3. Whenever the Group E fire area has an occupant load of 300 or more.

903.2.4 Group F-1.

An *automatic sprinkler system* shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. A Group F-1 *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group F-1 *fire area* is located more than three stories above grade plane.
3. The combined area of all Group F-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

903.2.4.1 Woodworking operations.

An *automatic sprinkler system* shall be provided throughout all Group F-1 occupancy *fire areas* that contain woodworking operations in excess of 2,500 square feet (232 m^2) in area that generate finely divided combustible waste or use finely divided combustible materials.

903.2.5 Group H.

Automatic sprinkler systems shall be provided in high-hazard occupancies as required in Sections 903.2.5.1 through 903.2.5.3.

903.2.5.1 General.

An *automatic sprinkler system* shall be installed in Group H occupancies.

903.2.5.2 Group H-5 occupancies.

An *automatic sprinkler system* shall be installed throughout buildings containing Group H-5 occupancies. The design of the sprinkler system shall be not less than that required under the *International Building Code* for the occupancy hazard classifications in accordance with Table 903.2.5.2.

Where the design area of the sprinkler system consists of a *corridor* protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

TABLE 903.2.5.2
GROUP H-5 SPRINKLER DESIGN CRITERIA

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

903.2.5.3 Pyroxylin plastics.

An *automatic sprinkler system* shall be provided in buildings, or portions thereof, where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg).

903.2.6 Group I.

An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exceptions:

1. An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1, Condition 1 facilities.
2. An *automatic sprinkler system* is not required where Group I-4 day care facilities are at the *level of exit discharge* and where every room where care is provided has not fewer than one exterior *exit* door.
3. In buildings where Group I-4 day care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided, all floors between the level of care and the *level of exit discharge* and all floors below the *level of exit discharge* other than areas classified as an open parking garage.

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 (1115 m^2).
2. A Group M *fire area* is located more than three stories above grade plane.
3. The combined area of all Group M *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group M occupancy used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464 m^2).

903.2.7.1 High-piled storage.

An *automatic sprinkler system* shall be provided as required in Chapter 32 in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

903.2.8 Group R.

An automatic sprinkler system shall be installed throughout all buildings with a Group R fire area in accordance with Section 903.3.

Exceptions:

1. A Group R-1, R-2, or combined R-1 and R-2 building where less than 4,500 square feet of the building area consists of R-1 fire area, R-2 fire area, or a combination of R-1 and R-2 fire areas.
2. A Group R-3 dwelling unit with less than 4,500 square feet of building area, excluding garages, unless the Group R-3 dwelling unit contains a state-licensed care facility that is required to be provided with an automatic sprinkler system as a condition of the license.

It's important to understand the difference between an R-3 and an R-3 dwelling unit when applying sprinkler

requirements to licensed care facilities classified in Table 202.1*. An R-3 must be constructed per the* Minnesota Building Code*. However there are specific state-licensed residential care programs that the legislature intended to be treated no more restrictively than a single family home under the* Minnesota Residential Code*. Such programs are classified as an R-3 dwelling unit.*

3. An automatic fire sprinkler system shall not be required if additions or alterations are made to existing Group R-3 or R-4 buildings or a portion thereof that do not have an automatic sprinkler system installed, unless required by a Minnesota license.
4. Group R-1 multiunit resort buildings, as defined in Minnesota Statutes, Section 157.15, and licensed by the Department of Health, with less than 9,250 square feet of building area.

903.2.8.1 Group R-3.

Where required by Section 903.2.8, Group R-3 occupancies shall be provided with an automatic sprinkler system that complies with Section 903.3.1.1, 903.3.1.2, or 903.3.1.

903.2.8.2 Group R-4.

Where required by Section 903.2.8, Group R-4 occupancies shall be provided with an automatic sprinkler system that complies with Section 903.3.1.1 or 903.3.1.2.

Exception: Group R-4 Condition 1 occupancies equipped with an automatic sprinkler system that complies with Section 903.3.1.3.

903.2.8.3 State-licensed facilities.

Group R-3 or R-4 occupancies containing facilities licensed by Minnesota shall be provided with an automatic sprinkler system as required by the applicable licensing provisions or this section, whichever is more restrictive.

903.2.8.4 Residential hospice facilities.

An automatic sprinkler system installed in accordance with NFPA 13 shall be provided throughout all buildings with a Group R-3 or R-4 fire area containing a residential hospice facility.

Exception: An automatic sprinkler system installed in accordance with Section 903.3.1.2 or 903.3.1.3 is permitted if all habitable spaces and closets are protected by an automatic sprinkler system.

903.2.9 Group S-1.

An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 12,000 square feet (1,115 m^2).
2. A Group S-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2,230 m^2).
4. Group S-1 fire area is used for the storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m^2).

903.2.9.1 Repair garages.

An *automatic sprinkler system* shall be provided throughout all buildings used as repair garages in accordance with Section 406.8 of the *International Building Code*, as shown:

1. Buildings having two or more stories above grade plane, including *basements*, with a *fire area* containing a repair garage exceeding 10,000 square feet (929 m^2).
2. Buildings not more than one story above grade plane, with a *fire area* containing a repair garage exceeding 12,000 square feet (1115 m^2).
3. Buildings with repair garages servicing vehicles parked in *basements*.
4. A Group S-1 *fire area* used for the repair of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).

903.2.9.2 Bulk storage of tires.

Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet (566 m^3) shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

903.2.9.3 Group S-1 upholstered furniture and mattresses.

An automatic sprinkler system shall be provided throughout a Group S-1 fire area used for the storage of upholstered furniture or mattresses that exceeds 2,500 square feet (232 m^2).

Exception: Self-service storage facilities (mini-storage) no greater than one story above grade plane where all storage spaces can be accessed directly from the exterior.

903.2.10 Group S-2 enclosed parking garages.

An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.6 of the *International Building Code* where either of the following conditions exists:

1. Where the *fire area* of the enclosed parking garage exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage is located beneath other groups.

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

903.2.10.1 Commercial parking garages.

An *automatic sprinkler system* shall be provided throughout buildings used for storage of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).

903.2.11 Specific buildings areas and hazards.

In all occupancies other than Group U, an *automatic sprinkler system* shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.6.

903.2.11.1 Stories without openings.

An *automatic sprinkler system* shall be installed throughout all *stories*, including *basements*, of all buildings where the floor area exceeds 1,500 square feet (139 m^2) and where the story does not comply with the following criteria for exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior *stairway* complying with Section 1011 or an outside ramp complying with Section 1012. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on not fewer than one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).
2. Openings entirely above the adjoining ground level totaling not less than 20 square feet (1.86 m^2) in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on not fewer than one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm). The height of the bottom of the clear opening shall not exceed 44 inches (1118 mm) measured from the floor.

903.2.11.1.1 Opening dimensions and access.

Openings shall have a minimum dimension of not less than 30 inches (762 mm). *Access* to such openings shall be provided for the fire department from the exterior and shall not be obstructed in a manner such that fire fighting or rescue cannot be accomplished from the exterior.

903.2.11.1.2 Openings on one side only.

Where openings in a story are provided on only one side and the opposite wall of such story is more than 75 feet (22 860 mm) from such openings, the story shall be equipped throughout with an *approved automatic sprinkler system*, or openings shall be provided on not fewer than two sides of the story.

903.2.11.1.3 Basements.

Where any portion of a *basement* is located more than 75 feet (22 860 mm) from openings required by Section 903.2.11.1, or where walls, partitions or other obstructions are installed that restrict the application of water from hose streams, the *basement* shall be equipped throughout with an *approved automatic sprinkler system*.

903.2.11.2 Rubbish and linen chutes.

An *automatic sprinkler system* shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes shall have additional sprinkler heads installed at alternate floors and at the lowest intake. Where a rubbish chute extends through a building more than one floor below the lowest intake, the extension shall have sprinklers installed that are recessed from the drop area of the chute and protected from freezing in accordance with Section 903.3.1.1. Such sprinklers shall be installed at alternate floors, beginning with the second level below the last intake and ending with the floor above the discharge. *Access* to sprinklers in chutes shall be provided for servicing.

903.2.11.3 Buildings 55 feet or more in height.

An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exceptions:

1. Open parking structures.
2. Occupancies in Group F-2.

903.2.11.4 Fire protection for exhaust systems.

Where required by the *Minnesota Mechanical Code*, automatic sprinklers shall be provided in ducts having a cross-sectional area of 75 square inches (480 cm^2) or more and that: (1) convey flammable or combustible components; or (2) have the potential for combustible residue buildup on the inside. When sprinkler protection is installed, means shall be provided to prevent water accumulation in the duct and the flow of water back to a process where the application of water constitutes a serious life or fire hazard.

903.2.11.5 Commercial cooking operations.

An *automatic sprinkler system* shall be installed in commercial kitchen exhaust hood and duct systems where an *automatic sprinkler system* is used to comply with Section 904.

903.2.11.6 Other required suppression systems.

In addition to the requirements of Section 903.2, the provisions indicated in Table 903.2.11.6 require the installation of a fire suppression system for certain buildings and areas.

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS

SECTION	SUBJECT
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement buildings
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1029.6.2.3	Smoke-protected assembly seating
1103.5.1	Existing Group A occupancies
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.3	Existing Group I-2 occupancies
1103.5.4	Existing Group I-2, Condition 2 occupancies
1103.5.4	Pyroxylin plastics
2108.2	Dry cleaning plants
2108.3	Dry cleaning machines
2309.3.2.6.2	Hydrogen motor fuel-dispensing area canopies
2404.2	Spray finishing in Group A, E, I or R
2404.4	Spray booths and spray rooms
2405.2	Dip-tank rooms in Group A, I or R
2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage

3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers
5003.8.4.1	Gas rooms
5003.8.5.3	Exhausted enclosures
5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses
5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m^3.

903.2.12 During construction.

Automatic sprinkler systems required during construction, *alteration* and demolition operations shall be provided in accordance with Section 3314.

903.3 Installation requirements.

Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.8.

903.3.1 Standards.

Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1, unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable. Automatic sprinkler systems installed in state-licensed or state-registered facilities shall be installed in accordance with this code and the applicable licensing or registration provisions of other Minnesota state agencies.

903.3.1.1 NFPA 13 sprinkler systems.

Where the provisions of this code require that a building or portion thereof be equipped throughout with an *automatic sprinkler system* in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1.1 and 903.3.1.1.2.

903.3.1.1.1 Exempt locations.

Automatic sprinklers shall not be required in the following rooms or 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 a room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

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

evacuation elevators designed in accordance with Section 3008 of the *International Building Code*.

7. Sprinkler protection shall not be installed in elevator shafts, elevator pits, or elevator machine rooms.

Exception: Health care occupancies that: (1) are required to have NFPA 13 systems; (2) are licensed by the Minnesota Department of Health; and (3) participate in Title XVIII (Medicare) or Title XIX (Medicaid) of the Social Security Act.

903.3.1.1.2 Bathrooms.

In Group R occupancies, sprinklers shall not be required in bathrooms that do not exceed 55 square feet (5 m^2) in area and are located within individual *dwelling units* or *sleeping units*, provided that walls and ceilings, including the walls and ceilings behind a shower enclosure or tub, are of noncombustible or limited-combustible materials with a 15-minute thermal barrier rating.

903.3.1.2 NFPA 13R sprinkler systems.

Automatic sprinkler systems in Group R occupancies up to and including four stories in height in buildings not exceeding 60 feet (18 288 mm) in height above grade plane shall be permitted to be installed throughout in accordance with NFPA 13R.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the *International Building Code* shall be measured from the horizontal assembly creating separate buildings.

903.3.1.2.1 Protection of decks and balconies.

Decks and balconies greater than 6 feet (1.8 m) above grade, greater than 4 feet (1.2 m) deep, with an area greater than 40 square feet (3.72 m^2), and attached to new Group R-1 or R-2 occupancy buildings protected in accordance with Section 903.3.1.2 that are three or more stories in height and with 30 or more units, shall be protected with sprinklers under the balcony or deck framing and under attic eaves when both of the following two conditions exist:

1. The building has an unsprinklered attic; and
2. The building has combustible siding.

903.3.1.2.2 Open-ended corridors.

Sprinkler protection shall be provided in *open-ended corridors* and associated *exterior stairways* and *ramps* as specified in Section 1027.6, Exception 3.

903.3.1.2.3 Attics.

Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by an *automatic sprinkler system*.
2. Where fuel-fired equipment is installed in an unsprinklered attic, not fewer than one quick-response intermediate temperature sprinkler shall be installed above the equipment.
3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or 510.4 of the *International Building Code*, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of required fire department vehicle access:
   3.1. Provide *automatic sprinkler system* protection.
   3.2. Construct the attic using noncombustible materials.
   3.3. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   3.4. Fill the attic with noncombustible insulation.

   The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.
4. Group R-4, Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   4.1. Provide *automatic sprinkler system* protection.
   4.2. Provide a heat detection system throughout the attic that is arranged to activate the building fire alarm system.
   4.3. Construct the attic using noncombustible materials.

4.4. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.

4.5. Fill the attic with noncombustible insulation.

903.3.1.3 NFPA 13D **sprinkler systems.**

Automatic sprinkler systems installed in one- and two-family *dwellings*; Group R-3; Group R-4, Condition 1; and *townhouses* shall be permitted to be installed throughout in accordance with NFPA 13D.

903.3.1.4 Buildings of undetermined use.

When fire sprinkler systems are required in buildings of undetermined use, they shall be designed and installed to have a sprinkler density of not less than that required for an Ordinary Hazard Group 2 use with a minimum design area of 3,000 square feet (279 m^2). Use is considered undetermined if not specified at the time a permit is issued. Where a subsequent occupancy requires a system with greater capability, it shall be the responsibility of the owner to upgrade the system to the required density for the new hazard, use or occupancy.

903.3.1.5 Special sprinkler design criteria.

When fire sprinkler systems are required in areas containing the following uses, they shall be designed and installed to have a sprinkler density of not less than that required for an Ordinary Hazard Group 2 use:

1. Chemistry labs; or
2. Wrestling rooms or gymnastic rooms.

903.3.1.6 Modifications to sprinkler standards.

The sprinkler installation standards as referenced in Sections 903.3.1.1, 903.3.1.2, and 903.3.1.3 are modified as follows:

903.3.1.6.1 Hose stream requirements.

When, in the opinion of the fire chief, an adequate alternate water supply for hose stream requirements is provided or available, the water supply requirements for the sprinkler system hose stream demands may be modified.

Section 903.3.1.6.1 *relaxes the requirements for a hose stream allowance when the sprinkler system is supplied by a private water system (well, tank, or other supply). A hose stream allowance is typically added to the sprinkler system demand due to concerns that the fire department will draw water from a hydrant and potentially decrease the water available for sprinkler operation. With a private water system this is unlikely to occur.*

903.3.1.6.2 Elevator shafts and equipment.

Sprinkler protection shall not be installed in elevator shafts, elevator pits or elevator machine rooms.

Exception: Health care occupancies that: (1) are required to have NFPA 13 systems; (2) are licensed by the Minnesota Department of Health; and (3) participate in Title XVIII (Medicare) or Title XIX (Medicaid) of the Social Security Act.

903.3.1.6.3 Swimming pools.

Sprinkler protection need not be provided on the ceiling of rooms containing swimming pools when the pool area is used exclusively for swimming purposes and when sprinklers are provided around the perimeter of the pool area.

903.3.1.6.4 NFPA 13 **modifications.**

(See MN Rule 7511.0903, Subp. 4 for modifications).

903.3.1.6.5 Vestibules.

Sprinkler protection is not required in vestibules that meet all of the following conditions:

1. The vestibule is 225 square feet or less in floor area;
2. The vestibule is of noncombustible or limited combustible construction;
3. The vestibule has glazing allowing vision into vestibule;
4. The vestibule's only purpose is ingress and egress; and
5. The vestibule contains no fueled equipment, flammable or combustible liquids, or furniture. Incidental combustible storage in the vestibule is limited to five cubic feet of material.

903.3.1.6.6 NFPA 13D **sprinkler systems.**

Automatic sprinkler systems installed in townhouses and Groups R-3 and R-4, Condition 1 occupancies shall be permitted to be installed throughout in accordance with NFPA 13D. Attached garages in townhouse buildings are required to have one dry head sprinkler located within 5 linear feet of each door installed in the common wall separating the dwelling unit and the attached garage.

903.3.2 Quick-response and residential sprinklers.

Where *automatic sprinkler systems* are required by this code, quick-response or residential automatic sprinklers shall be installed in all of the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing care recipients*sleeping units* in Group I-2 in accordance with the *International Building Code*.
2. Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.
3. *Dwelling units* and *sleeping units* in Group I-1 and R occupancies.
4. Light-hazard occupancies as defined in NFPA 13.

903.3.3 Obstructed locations.

Automatic sprinklers shall be installed with regard to obstructions that will delayactivation or obstruct the water distribution pattern and shall be in accordance with the applicable *automatic sprinkler system* standard that is being used. Automatic sprinklers shall be installed in or under covered kiosks, displays, booths, concession stands or equipment that exceeds 4 feet (1219 mm) in width. Not less than a 3-foot (914 mm) clearance shall be maintained between automatic sprinklers and the top of piles of *combustible fibers*.

Exception: Kitchen equipment under exhaust hoods protected with a fire-extinguishing system in accordance with Section 904.

903.3.4 Actuation.

Automatic sprinkler systems shall be automatically actuated unless specifically provided for in this code.

903.3.5 Water supplies.

Water supplies for *automatic sprinkler systems* shall comply with this section and the standards referenced inSection 903.3.1. The potable water supply shall be protected against backflow in accordance with the requirements of this section and the *International Plumbing Code*. For connections to public waterworks systems, the water supply test used for design of fire protection systems shall be adjusted to account for seasonal and daily pressure fluctuations based on information from the water supply authority and as approved by the *fire code official*.

903.3.5.1 Domestic services.

Where the domestic service provides the water supply for the*automatic sprinkler system*, the supply shall be in accordance with this section.

903.3.5.2 Residential combination services.

A single combination water supply shall be allowed provided that the domestic demand is added to the sprinkler demand as required by NFPA 13R.

903.3.6 Hose threads.

Fire hose threads and fittings used in connection with*automatic sprinkler systems* shall be as prescribed by the*fire code official*.

903.3.7 Fire department connections.

Fire department connections for*automatic sprinkler systems* shall be installed in accordance withSection 912.

903.3.8 Limited area sprinkler systems.

Limited area sprinkler systems shall be in accordance with the standards listed inSection 903.3.1 except as provided in Sections 903.3.8.1 through 903.3.8.5.

903.3.8.1 Number of sprinklers.

Limited area sprinkler systems shall not exceed six sprinklers in any single fire area.

903.3.8.2 Occupancy hazard classification.

Only areas classified by NFPA 13 as Light Hazard or Ordinary Hazard Group 1 shall be permitted to be protected by limited area sprinkler systems.

903.3.8.3 Piping arrangement.

Where a limited area sprinkler system is installed in a building with an automatic wet standpipe system, sprinklers shall be supplied by the standpipe system. Where a limited area sprinkler system is installed in a building without an automatic wet standpipe system, water shall be permitted to be supplied by the plumbing system provided that the plumbing system is capable of simultaneously supplying domestic and sprinkler demands.

903.3.8.4 Supervision.

Control valves shall not be installed between the water supply and sprinklers unless the valves are of an *approved* indicating type that are supervised or secured in the open position.

903.3.8.5 Calculations.

Hydraulic calculations in accordance with NFPA 13 shall be provided to demonstrate that the available water flow and pressure are adequate to supply all sprinklers installed in any single *fire area* with discharge densities corresponding to the hazard classification.

903.3.9 Sprinkler system design pressure safety margin.

For new sprinkler systems or additions to existing sprinkler systems, the available water supply shall exceed the sprinkler system demand, including the hose stream requirements, by 5 psi (0.34 bars) or more.

Exception: NFPA 13D systems installed in accordance with Section 903.3.1.3.

903.4 Sprinkler system supervision and alarms.

Valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.
2. Limited area sprinkler systems in accordance with Section 903.3.8.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.
8. For existing sprinkler systems, monitoring is required when the number of sprinklers is 100 or more.

903.4.1 Monitoring.

Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an *approved* supervising station or, where *approved* by the *fire 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 electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

903.4.2 Alarms.

An approved audible alarm and an approved visible alarm are required on the exterior of the building in an approved location. These alarms can be part of the same device or separate devices. The alarms shall be connected to each automatic sprinkler system. The alarms shall be located above the fire department connection and visible from the street or nearest point of fire department vehicle access, or as otherwise approved by the fire code official. Such sprinkler water-flow alarms shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

903.4.3 Floor control valves.

Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings.

903.4.4 Valve security.

All valves controlling water supplies for automatic sprinklers shall be locked or secured in the open position.

Exception: Valves located in a room or space when access is limited to essential personnel only.

903.5 Testing and maintenance.

Sprinkler systems shall be tested and maintained in accordance with Section 901.

903.6 Where required in existing buildings and structures.

An *automatic sprinkler system* shall be provided in existing buildings and structures where required in Chapter 11.

SECTION 904
ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

904.1 General.

Automatic fire-extinguishing systems, other than *automatic sprinkler systems*, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

904.1.1 Certification of service personnel for fire-extinguishing equipment.

Service personnel installing, providing, or conducting maintenance on automatic fireextinguishing systems, other than automatic sprinkler systems, shall possess a valid certificate issued by an approved organization for the type of system and work performed.

IFC Section 904.1.1 *requires personnel servicing automatic fire-extinguishing systems to be certified or licensed by a governmental agency. This would require legislative action and there is no such mandate at this time. Personnel should be factory trained and possess some type of certificate indicating this.*

904.2 Where permitted.

Automatic fire-extinguishing systems installed as an alternative to the required *automatic sprinkler systems* of Section 903 shall be *approved* by the *fire code official*.

904.2.1 Restriction on using automatic sprinkler system exceptions or reductions.

Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed for *automatic sprinkler systems* or by other requirements of this code.

904.2.2 Commercial hood and duct systems.

Each required commercial kitchen exhaust hood and duct system required by Section 607 to have a Type I hood shall be protected with an *approved* automatic fire-extinguishing system installed in accordance with this code.

904.3 Installation.

Automatic fire-extinguishing systems shall be installed in accordance with this section.

904.3.1 Electrical wiring.

Electrical wiring shall be in accordance with NFPA 70.

904.3.2 Actuation.

Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with Section 904.12.1. Where more than one hazard could be simultaneously involved in fire due to their proximity, all hazards shall be protected by a single system designed to protect all hazards that could become involved.

Exception: Multiple systems shall be permitted to be installed if they are designed to operate simultaneously.

904.3.3 System interlocking.

Automatic equipment interlocks with fuel shutoffs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents and other features necessary for proper operation of the fire-extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

904.3.4 Alarms and warning signs.

Where alarms are required to indicate the operation of automatic fire-extinguishing systems, distinctive audible, visible alarms and warning signs shall be provided to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning signal shall be provided to alert occupants once agent discharge has begun. Audible signals shall be in accordance with Section 907.5.2.

904.3.5 Monitoring.

Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with NFPA 72.

904.4 Inspection and testing.

Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

904.4.1 Inspection.

Prior to conducting final acceptance tests, all of the following items shall be inspected:

1. Hazard specification for consistency with design hazard.
2. Type, location and spacing of automatic- and manual-initiating devices.
3. Size, placement and position of nozzles or discharge orifices.
4. Location and identification of audible and visible alarm devices.
5. Identification of devices with proper designations.
6. Operating instructions.

904.4.2 Alarm testing.

Notification appliances, connections to fire alarm systems and connections to *approved* supervising stations shall be tested in accordance with this section and Section 907 to verify proper operation.

904.4.2.1 Audible and visible signals.

The audibility and visibility of notification appliances signaling agent discharge or system operation, where required, shall be verified.

904.4.3 Monitor testing.

Connections to protected premises and supervising station fire alarm systems shall be tested to verify proper identification and retransmission of alarms from automatic fire-extinguishing systems.

904.5 Wet-chemical systems.

Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17A and their listing. Records of inspections and testing shall be maintained.

904.5.1 System test.

Systems shall be inspected and tested for proper operation at six-month intervals. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.

904.5.2 Fusible link maintenance.

Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

904.6 Dry-chemical systems.

Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17 and their listing. Records of inspections and testing shall be maintained.

904.6.1 System test.

Systems shall be inspected and tested for proper operation at six-month intervals. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed, and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.

904.6.2 Fusible link maintenance.

Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

904.7 Foam systems.

Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 11 and NFPA 16 and their listing. Records of inspections and testing shall be maintained.

904.7.1 System test.

Foam-extinguishing systems shall be inspected and tested at intervals in accordance with NFPA 25.

904.8 Carbon dioxide systems.

Carbon dioxide extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12 and their listing. Records of inspections and testing shall be maintained.

904.8.1 System test.

Systems shall be inspected and tested for proper operation at 12-month intervals.

904.8.2 High-pressure cylinders.

High-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at six-month intervals. Where a container shows a loss in original content of more than 10 percent, the cylinder shall be refilled or replaced.

904.8.3 Low-pressure containers.

The liquid-level gauges of low-pressure containers shall be observed at one-week intervals. Where a container shows a content loss of more than 10 percent, the container shall be refilled to maintain the minimum gas requirements.

904.8.4 System hoses.

System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.

904.8.4.1 Test procedure.

Hoses shall be tested at not less than 2,500 pounds per square inch (psi) (17 238 kPa) for high-pressure systems and at not less than 900 psi (6206 kPa) for low-pressure systems.

904.8.5 Auxiliary equipment.

Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure that such components are in proper operating condition.

904.9 Halon systems.

Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12A and their listing. Records of inspections and testing shall be maintained.

904.9.1 System test.

Systems shall be inspected and tested for proper operation at 12-month intervals.

904.9.2 Containers.

The extinguishing agent quantity and pressure of containers shall be checked at six-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure (adjusted for temperature) of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

904.9.3 System hoses.

System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.

904.9.3.1 Test procedure.

For Halon 1301 systems, hoses shall be tested at not less than 1,500 psi (10 343 kPa) for 600 psi (4137 kPa) charging pressure systems and not less than 900 psi (6206 kPa) for 360 psi (2482 kPa) charging pressure systems. For Halon 1211 hand-hose line systems, hoses shall be tested at 2,500 psi (17 238 kPa) for high-pressure systems and 900 psi (6206 kPa) for low-pressure systems.

904.9.4 Auxiliary equipment.

Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure such components are in proper operating condition.

904.10 Clean-agent systems.

Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 2001 and their listing. Records of inspections and testing shall be maintained.

904.10.1 System test.

Systems shall be inspected and tested for proper operation at 12-month intervals.

904.10.2 Containers.

The extinguishing agent quantity and pressure of the containers shall be checked at six-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure, adjusted for temperature, of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

904.10.3 System hoses.

System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. All hoses shall be tested at five-year intervals.

904.11 Automatic water mist systems.

Automatic water mist systems shall be permitted in applications that are consistent with the applicable listing or approvals and shall comply with Sections 904.11.1 through 904.11.3.

904.11.1 Design and installation requirements.

Automatic water mist systems shall be designed and installed in accordance withSections 904.11.1.1 through

904.11.1.4.

904.11.1.1 General.

Automatic water mist systems shall be designed and installed in accordance with NFPA 750 and the manufacturer's instructions.

904.11.1.2 Actuation.

Automatic water mist systems shall be automatically actuated.

904.11.1.3 Water supply protection.

Connections to a potable water supply shall be protected against backflow in accordance with the *International Plumbing Code*.

904.11.1.4 Secondary water supply.

Where a secondary water supply is required for an *automatic sprinkler system*, an *automatic water mist system* shall be provided with an *approved* secondary water supply.

904.11.2 Water mist system supervision and alarms.

Supervision and alarms shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.

904.11.2.1 Monitoring.

Monitoring shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.1.

904.11.2.2 Alarms.

Alarms shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.2.

904.11.2.3 Floor control valves.

Floor control valves shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.3.

904.11.3 Testing and maintenance.

Automatic water mist systems shall be tested and maintained in accordance with Section 901.6.

904.12 Commercial cooking systems.

The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with UL 300 and *listed* and *labeled* for the intended application. Other types of automatic fire-extinguishing systems shall be *listed* and *labeled* for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, NFPA 96, its listing and the manufacturer's installation instructions. Automatic fire-extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. *Automatic sprinkler systems*, NFPA 13.
3. Automatic water mist systems, NFPA 750.
4. Foam-water sprinkler system or foam-water spray systems, NFPA 16.
5. Dry-chemical extinguishing systems, NFPA 17.
6. Wet-chemical extinguishing systems, NFPA 17A.

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and *listed*, *labeled* and installed in accordance with Section 304.1 of the *International Mechanical Code*.

904.12.1 Manual system operation.

A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.

904.12.2 System interconnection.

The actuation of the fire extinguishing system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

904.12.3 Carbon dioxide systems.

Where carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles

that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). Dampers shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. Where the damper is installed at the top of the duct, the top nozzle shall be immediately below the damper. Automatic carbon dioxide fire-extinguishing systems shall be sufficiently sized to protect all hazards venting through a common duct simultaneously.

904.12.3.1 Ventilation system.

Commercial-type cooking equipment protected by an automatic carbon dioxide extinguishing system shall be arranged to shut off the ventilation system upon activation.

904.12.4 Special provisions for automatic sprinkler systems.

Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, indicating-type control valve that is identified. *Access* to the control valve shall be provided.

904.12.4.1 Listed sprinklers.

Sprinklers used for the protection of fryers shall be tested in accordance with UL 199E, *listed* for that application and installed in accordance with their listing.

Relocated

904.12.5 Operations and maintenance.

Automatic fire-extinguishing systems protecting commercial cooking systems shall be maintained in accordance with Sections 904.12.5.1 through 904.12.5.3.

904.12.5.1 Existing automatic fire-extinguishing systems.

Where changes in the cooking media, positioning of cooking equipment or replacement of cooking equipment occur in existing commercial cooking systems, the automatic fire-extinguishing system shall be required to comply with the applicable provisions of Sections 904.12 through 904.12.4.

904.12.5.2 Extinguishing system service.

Automatic fire-extinguishing systems shall be serviced not less frequently than every six months and after activation of the system. Inspection shall be by qualified individuals, and a certificate of inspection shall be forwarded to the *fire code official* upon completion.

904.12.5.3 Fusible link and sprinkler head replacement.

Fusible links and automatic sprinkler heads shall be replaced annually, and other protection devices shall be serviced or replaced in accordance with the manufacturer's instructions.

Exception: Frangible bulbs are not required to be replaced annually.

904.13 Domestic cooking systems.

Cooktops and ranges installed in the following occupancies shall be protected in accordance with Section 904.13.1:

1. In Group I-1 occupancies where domestic cooking facilities are installed in accordance with Section 420.8 of the *International Building Code*.
2. In Group I-2, Condition 1 occupancies where domestic cooking facilities are installed in accordance with Section 407.2.6 of the *International Building Code*.
3. In Group R-2 congregate living facilities where domestic cooking facilities are installed in accordance with Section 420.10 of the *Minnesota Building Code*.

904.13.1 Protection from fire.

Cooktops and ranges shall be protected in accordance with Section 904.13.1.1 or 904.13.1.2.

904.13.1.1 Automatic fire-extinguishing system.

The domestic recirculating or exterior vented cooking hood provided over the cooktop or range shall be equipped with an approved automatic fire-extinguishing system complying with the following:

1. The automatic fire-extinguishing system shall be of a type recognized for protection of domestic cooking equipment. Preengineered automatic fire-extinguishing systems shall be listed and labeled in accordance with UL 300A and installed in accordance with the manufacturer's instructions.
2. Manual actuation of the fire-extinguishing system shall be provided in accordance with Section 904.12.1.
3. Interconnection of the fuel and electric power supply shall be in accordance with Section 904.12.2.

904.13.1.2 Ignition prevention.

Cooktops and ranges shall include burners that have been tested and listed to prevent ignition of cooking oil with burners turned on to their maximum heat settings and allowed to operate for 30 minutes.

904.14 Aerosol fire-extinguishing systems.

Aerosol fire-extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with Sections 901 and 904.4, NFPA 2010, and in accordance with their listing.

Such devices and appurtenances shall be listed and installed in compliance with manufacturer's instructions.

904.14.1 Maintenance.

Not less than semiannually, an inspection shall be conducted by a trained person to assess whether the system is in working order. Not less than annually, a certified fire suppression contractor having knowledge of and training in the installation, operation and maintenance of the specific fire-extinguishing system shall inspect, test, service and maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals.

SECTION 905
STANDPIPE SYSTEMS

905.1 General.

Standpipe systems shall be provided in new buildings and structures in accordance with Sections 905.2 through 905.11. In buildings used for *high-piled combustible storage*, fire protection shall be in accordance with Chapter 32.

905.2 Installation standard.

Standpipe systems shall be installed in accordance with this section and NFPA 14. Fire department connections for standpipe systems shall be in accordance with Section 912.

905.2.1 Modification to standards.

In buildings other than high rise that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, and a Class I standpipe system, the pipe shall be sized to meet the pressure and flow requirements for the sprinkler system. Such systems shall comply with Sections 905.2.1.1 through 905.2.1.4.

905.2.1.1 System pipe size.

Pipe sizes for combined portions of the sprinkler and standpipe systems shall not be less than 4 inches (101.6 mm).

905.2.1.2 System design flow and pressure.

The standpipe shall provide a minimum pressure of 100 psi (6.9 bar) at the uppermost outlet and a minimum flow rate of 250 gpm (946 L/min.) at the two hydraulically most remote hose connections on the standpipe when the standpipe system is supported through the fire department connection. The hydraulic calculations shall be performed between the hydraulically most demanding standpipe hose connection and the fire department connection.

905.2.1.3 Design pressure.

A maximum design pressure of 150 psi (10.3 bars) is permitted at the fire department connection when the standpipe is supported by local fire department apparatus.

905.2.1.4 Automatic sprinkler system demand.

The automatic sprinkler system demand, including the inside and outside hose stream demands from NFPA 13, is to be provided by the municipal water supply system without requiring fire department pumping into the system.

905.3 Required installations.

Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.10. Standpipe systems are allowed to be combined with automatic sprinkler systems.

Exception: Standpipe systems are not required in Group R-3 occupancies.

905.3.1 Height.

Class I wet standpipe systems shall be installed throughout buildings where any of the following conditions exist:

1. Four or more stories are above or below grade plane.
2. The floor level of the highest story is located more than 30 feet (9,144 mm) above the lowest level of the fire department vehicle access.
3. The floor level of the lowest story is located more than 30 feet (9,144 mm) below the highest level of fire department vehicle access.

Exception: Class I manual, automatic, or semiautomatic dry standpipes are allowed in buildings that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.

905.3.1.1 Lowest level.

In determining the lowest level of fire department vehicle access, the following areas should not be considered:

1. Recessed loading docks for four vehicles or less; and
2. Areas where topography makes access from the fire department vehicle to the building impractical or impossible.

905.3.2 Group A.

Class I automatic wet standpipes shall be provided in nonsprinklered Group A buildings having an *occupant load* exceeding 1,000 persons.

Exceptions:

1. Open-air-seating spaces without enclosed spaces.
2. Class I automatic dry and semiautomatic dry standpipes or manual wet standpipes are allowed in buildings that are not high-rise buildings.

905.3.2.1 Group A exhibition.

Class I automatic standpipes shall be provided in Group A-3 occupancies where the floor area used for exhibition exceeds 12,000 square feet (1,115 m^2).

905.3.3 Covered and open mall buildings.

Covered mall and open mall buildings shall be equipped throughout with a standpipe system where required by Section 905.3.1. Mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the *automatic sprinkler system* sized to deliver water at 250 gallons per minute (946.4 L/min) at the hydraulically most remote hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed not to exceed a 50 pounds per square inch (psi) (345 kPa) residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each exit passageway or corridor.
2. At each floor-level landing within *interior exit stairways* opening directly on the mall.
3. At exterior public entrances to the mall of a covered mall building.
4. At public entrances at the perimeter line of an open mall building.
5. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 200 feet (60 960 mm) from a hose connection.

905.3.4 Stages.

Stages are not required to be equipped with standpipe systems.

905.3.5 Underground buildings.

Underground buildings shall be equipped throughout with a Class I automatic wet or manual wet standpipe system.

905.3.6 Helistops and heliports.

Each building with a rooftop helistop or heliport shall be equipped with a Class I standpipe system extended to the roof level on which the helistop or heliport is located in accordance with Section 2007.5.

905.3.7 Marinas and boatyards.

Standpipes in marinas and boatyards shall comply with Chapter 36.

905.3.8 Rooftop gardens and landscaped roofs.

Buildings or structures that have rooftop gardens or landscaped roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the rooftop garden or landscaped roof is located.

905.3.9 Detention and correctional facilities.

Regardless of the height of the building or number of stories, every building in a Group I-3 detention and correctional facility, where 50 or more persons are under restraint or security under Occupancy Condition 3, 4 or 5, shall be provided with a Class I automatic wet or semiautomatic dry standpipe system.

Exception: Combined systems meeting the provisions of Section 905.2 may be used.

When acceptable to the fire chief, fire department connections may be located inside all security walls or fences on the property.

Standpipes shall be located in accordance with Section 905. In addition, standpipes shall be located so that it will not be necessary to extend hose lines through smoke barriers. When located in cell complexes, standpipes may be located in secured pipe chases.

905.3.10 Group R-2 occupancies; small hose connections.

Small hose connections shall be installed in Group R-2 occupancies three or more stories in height where any portion of the building's interior area is more than 200 feet (60,960 mm) of travel, vertically or horizontally, from the nearest point of fire department vehicle access. Small hose connections required by this section shall comply with the following:

1. Supply one $1^1/_2$-inch (38 mm) fire hose valve at each floor level or intermediate stair landing in each required and enclosed stairway.

2. The water for the small hose connections shall be supplied separately from the sprinkler system protecting that area so that the small hose connections are still functional if the water supply to the sprinkler system is shut down following fire extinguishment.
3. The piping shall be a minimum of $1^1/_2$-inch (38 mm).
4. The water shall be supplied from a wet-pipe sprinkler system only.
5. The piping shall be comprised of metallic piping and hose valve connections.

Permanent signage shall be required which reads "Fire Department Overhaul Hose Connection" at each connection in the building. If a separate standpipe system is provided, a sign shall also be provided at the exterior fire department connection.

This section clarifies the original intent of these hose connections from the previous code. It provides specific installation instructions. These will be in buildings protected with a sprinkler system and intended for fire department overhaul operations, extinguishing small fires the sprinkler system controlled. The intent is to provide a hose connection in three- and four-story buildings that were not required to have a standpipe system. Standpipes are still required in buildings that meet the requirements in Section 905.3.

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 *interior exit stairway*, a hose connection shall be provided for each story above and below grade plane. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open stairs that are not greater than 75 feet (22 860 mm) apart.

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 an *interior exit stairway* hose connection 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 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 an *interior exit stairway* hose connection 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. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line 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), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

905.4.1 Protection.

Risers and laterals of Class I standpipe systems not located within an *interior exit stairway* shall be protected by a degree of *fire resistance* equal to that required for vertical enclosures in the building in which they are located.

Exception: In buildings equipped throughout with an *approved automatic sprinkler system*, laterals that are not located within an *interior exit stairway* are not required to be enclosed within fire-resistance-rated construction.

905.4.2 Interconnection.

In buildings where more than one standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

905.5 Location of Class II standpipe hose connections.

Class II standpipe hose connections shall be located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose. Class II standpipe hose connections shall be located where they will have *ready access*.

905.5.1 Groups A-1 and A-2.

Deleted.

905.5.2 Protection.

Fire-resistance-rated protection of risers and laterals of Class II standpipe systems is not required.

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 code official*.

905.6 Location of Class III standpipe hose connections.

Deleted.

905.7 Cabinets.

Cabinets containing fire-fighting equipment, such as standpipes, fire hose, fire extinguishers or fire department valves, shall not be blocked from use or obscured from view.

905.7.1 Cabinet equipment identification.

Cabinets shall be identified in an *approved* manner by a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, indicating the equipment contained therein.

Exceptions:

1. Doors not large enough to accommodate a written sign shall be marked with a permanently attached pictogram of the equipment contained therein.
2. Doors that have either an *approved* visual identification clear glass panel or a complete glass door panel are not required to be marked.

905.7.2 Locking cabinet doors.

Cabinets shall be unlocked.

Exceptions:

1. Visual identification panels of glass or other *approved* transparent frangible material that is easily broken and allows access.
2. *Approved* locking arrangements.
3. Group I-3 occupancies.

905.8 Dry standpipes.

Dry standpipes shall not be installed.

Exception: Where subject to freezing and in accordance with NFPA 14.

905.9 Valve supervision.

Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall be transmitted to the control unit.

Exceptions:

1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision.
2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.

905.10 During construction.

Standpipe systems required during construction and demolition operations shall be provided in accordance with Section 3313.

905.11 Locking standpipe outlet caps.

The *fire code official* is authorized to require locking caps on the outlets on dry standpipes where the responding fire department carries key wrenches for the removal that are compatible with locking FDC connection caps.

905.12 Existing buildings.

Where required in Chapter 11, existing structures shall be equipped with standpipes installed in accordance with Section 905.

SECTION 906
PORTABLE FIRE EXTINGUISHERS

906.1 Where required.

Portable fire extinguishers shall be installed in the following locations:

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

   Exception: In Group E occupancies equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, fire extinguishers shall be required only in laundry and soiled linen rooms, boiler and furnace rooms, mechanical and electrical rooms, garages, stages, projection booths, shops, laboratories, kitchens, locker rooms, custodial closets, trash-collection rooms, storage rooms greater than 100 square feet, and similar areas.

2. Within 30 feet (9,144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 congregate living facilities.
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 3315.1.
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, where required by the fire code official.
7. R-3 occupancies used as family day care, group family day care, foster care, adult family day services, and residential hospices.

TABLE 906.1
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS

SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus
2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.3	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3104.12	Tents and membrane structures
3206.10	High-piled storage
3315.1	Buildings under construction or demolition
3317.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
3703.6	Combustible fibers

5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units
5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5906.5.7	Flammable solids
6108.2	LP-gas

For the reference to IFC Section 6108.2 *for LP-Gas in* Table 906.1*, see* NFPA 58 *for fire extinguisher requirements.* Chapter 61 *has been deleted and replaced with the 2017 edition of* NFPA 58*.*

906.2 General requirements.

Portable fire extinguishers shall be selected, installed, and maintained in accordance with this section and NFPA 10. Section 7.1.2 of NFPA 10 is deleted.

NFPA 10 *Section 7.1.2 requires personnel servicing fire extinguishers to be certified or licensed by a governmental agency. This would require legislative action, and there is no such mandate at this time. Personnel should be factory trained and possess some type of certificate indicating this.*

Exceptions:

1. The distance of travel to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. Thirty-day inspections shall not be required and maintenance shall be allowed to be once every 3 years for dry-chemical or halogenated agent portable fire extinguishers that are supervised by a *listed* and *approved* electronic monitoring device, provided that all of the following conditions are met:
   - 2.1. Electronic monitoring shall confirm that extinguishers are properly positioned, properly charged and unobstructed.
   - 2.2. Loss of power or circuit continuity to the electronic monitoring device shall initiate a trouble signal.
   - 2.3. The extinguishers shall be installed inside of a building or cabinet in a noncorrosive environment.
   - 2.4. Electronic monitoring devices and supervisory circuits shall be tested every 3 years when extinguisher maintenance is performed.
   - 2.5. A written log of required hydrostatic test dates for extinguishers shall be maintained by the *owner* to verify that hydrostatic tests are conducted at the frequency required by NFPA 10.
3. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

906.2.1 Certification of service personnel for portable fire extinguishers.

Service personnel providing or conducting maintenance on portable fire extinguishers shall possess a valid certificate issued by an *approved* organization for the type of work performed.

906.3 Size and distribution.

The size and distribution of portable fire extinguishers shall be in accordance with Sections 906.3.1 through 906.3.4.

TABLE 906.3(1)
FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS

	LIGHT (Low) HAZARD OCCUPANCY	**ORDINARY (Moderate) HAZARD OCCUPANCY**	**EXTRA (High) HAZARD OCCUPANCY**
Minimum-rated single extinguisher	2-A[c]	2-A	4-A[a]
Maximum floor area per unit of A	3,000 square feet	1,500 square feet	1,000 square feet
Maximum floor area for extinguisher[b]	11,250 square feet	11,250 square feet	11,250 square feet

Maximum distance of travel to extinguisher	75 feet	75 feet	75 feet

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, 1 gallon = 3.785 L.

a. Two $2^1/_2$-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.

b. Annex E.3.3 of NFPA 10 provides more details concerning application of the maximum floor area criteria.

c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.

TABLE 906.3(2)
FIRE EXTINGUISHERS FOR FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTHS OF LESS THAN OR EQUAL TO 0.25 INCH[a]

TYPE OF HAZARD	BASIC MINIMUM EXTINGUISHER RATING	MAXIMUM DISTANCE OF TRAVEL TO EXTINGUISHERS (feet)
Light (Low)	5-B	30
	10-B	50
Ordinary (Moderate)	10-B	30
	20-B	50
Extra (High)	40-B	30
	80-B	50

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. For requirements on water-soluble flammable liquids and alternative sizing criteria, see Section 5.5 of NFPA 10.

906.3.1 Class A fire hazards.

The minimum sizes and distribution of portable fire extinguishers for occupancies that involve primarily Class A fire hazards shall comply with Table 906.3(1).

906.3.2 Class B fire hazards.

Portable fire extinguishers for occupancies involving flammable or *combustible liquids* with depths less than or equal to 0.25 inch (6.4 mm) shall be selected and placed in accordance with Table 906.3(2).

Portable fire extinguishers for occupancies involving flammable or *combustible liquids* with a depth of greater than 0.25-inch (6.4 mm) shall be selected and placed in accordance with NFPA 10.

906.3.3 Class C fire hazards.

Portable fire extinguishers for Class C fire hazards shall be selected and placed on the basis of the anticipated Class A or B hazard.

906.3.4 Class D fire hazards.

Portable fire extinguishers for occupancies involving combustible metals shall be selected and placed in accordance with NFPA 10.

Relocated

906.4 Cooking equipment fires.

Fire extinguishers provided for the protection of cooking equipment shall be of an *approved* type compatible with the automatic fire-extinguishing system agent. Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K-rated portable extinguisher in accordance with Sections 906.1, Item 2, 906.4.1 and 906.4.2 as applicable.

906.4.1 Portable fire extinguishers for solid fuel cooking appliances.

Solid fuel cooking appliances, whether or not under a hood, with fireboxes 5 cubic feet (0.14 m^3) or less in volume shall have a minimum 2.5-gallon (9 L) or two 1.5-gallon (6 L) Class K wet-chemical portable fire extinguishers located in accordance with Section 906.1.

906.4.2 Class K portable fire extinguishers for deep fat fryers.

Where hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided as follows:

1. For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity.
2. For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one additional Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity shall be provided.
3. For individual fryers exceeding 6 square feet (0.55 m^2) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.

906.5 Conspicuous location.

Portable fire extinguishers shall be located in conspicuous locations where they will have *ready access* and be immediately available for use. These locations shall be along normal paths of travel, unless the *fire code official* determines that the hazard posed indicates the need for placement away from normal paths of travel.

906.6 Unobstructed and unobscured.

Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, means shall be provided to indicate the locations of extinguishers.

906.7 Hangers and brackets.

Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.

906.8 Cabinets.

Cabinets used to house portable fire extinguishers shall not be locked.

Exceptions:

1. Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.
2. In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided that the staff has keys.

906.9 Extinguisher installation.

The installation of portable fire extinguishers shall be in accordance with Sections 906.9.1 through 906.9.3.

906.9.1 Extinguishers weighing 40 pounds or less.

Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 5 feet (1524 mm) above the floor.

906.9.2 Extinguishers weighing more than 40 pounds.

Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 3.5 feet (1067 mm) above the floor.

906.9.3 Floor clearance.

The clearance between the floor and the bottom of installed hand-held portable fire extinguishers shall be not less than 4 inches (102 mm).

906.10 Wheeled units.

Wheeled fire extinguishers shall be conspicuously located in a designated location.

SECTION 907
FIRE ALARM AND DETECTION SYSTEMS

907.1 General.

This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.9 are applicable to existing buildings and structures.

907.1.1 Construction documents.

Construction documents for fire alarm systems shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code, the *International Building Code* and relevant laws, ordinances, rules and regulations, as determined by the *fire code official*.

907.1.2 Fire alarm shop drawings.

Shop drawings for fire alarm systems shall be submitted for review and approval before system installation, and shall include all of the following where applicable to the system being installed:

1. A floor plan that indicates the use of all rooms.
2. Locations of alarm-initiating devices.
3. Locations of alarm notification appliances, including candela ratings for visible alarm notification appliances.
4. Design minimum audibility level for occupant notification.
5. Maximum sound pressure.
6. Location of fire alarm control unit, transponders, and notification power supplies.
7. Annunciators.
8. Power connections.
9. Battery calculations.
10. Conductor type and size.
11. Voltage drop calculations.
12. Manufacturers' data sheets indicating model numbers and listing information for equipment, devices, and materials.
13. Details of ceiling height and construction.
14. The interface of fire safety control functions.
15. Classification of the supervising station.

907.1.3 Equipment.

Systems and components shall be *listed* and *approved* for the purpose for which they are installed.

907.2 Where required in new buildings and occupancies.

An approved manual, automatic, or manual and automatic fire alarm system shall be provided in new buildings and occupancies in accordance with Sections 907.2.1 through 907.2.24.2 and NFPA 72. For the purposes of Sections 907.2.1 through 907.2.24.2, fire barrier walls or fire walls shall not define separate buildings. In buildings containing mixed occupancies that are designed as separated uses (see Section 102.14), fire alarm and detection systems need only be installed in those occupancies where required by this section.

Exception: In areas protected by an approved, supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, automatic fire detectors required by Section 907.2 need not be provided. Where Section 907.2 requires smoke detectors, such protection shall be installed.

907.2.1 Group A, general.

A fire alarm system shall be installed in accordance with Sections 907.2.1 through 907.2.1.3 in Group A occupancies having an occupant load of 300 or more.

Exceptions:

1. Assembly areas used solely for worship purposes.
2. A fire alarm system is not required in buildings with an occupant load less than 1,000 when an approved automatic fire sprinkler system is installed throughout the building.
3. Assembly uses located inside Group E occupancies shall have alarms as required for the Group E occupancy.
4. Group A-5 occupancies.

907.2.1.1 Initiation.

Initiation of the fire alarm system shall be by automatic means. Approved automatic fire detectors shall be installed in laundry rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, kitchens, trash-collection rooms, storage rooms, and similar areas.

907.2.1.2 Notification.

The required fire alarm system shall activate an audible and visible notification appliance at a constantly attended location within the building for the purposes of initiating emergency action. A presignal feature and positive alarm sequencing in accordance with NFPA 72 are permitted. Occupant notification shall be by means of voice announcements, either live or prerecorded, initiated by the person in the constantly attended location.

Exception: Where no constantly attended location exists, an automatic fire alarm system providing a general evacuation signal or an approved emergency voice/alarm communications system is permitted.

907.2.1.3 System initiation in Group A occupancies with occupant load of 1,000 or more.

Activation of the fire alarm system in Group A occupancies with an occupant load of 1,000 or more shall immediately initiate an approved prerecorded message announcement using an approved emergency voice/alarm communications system in accordance with NFPA 72.

Exception: Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed three minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

907.2.2 Group B, general.

A fire alarm system shall be installed in accordance withSections 907.2.2 through 907.2.2.3 in Group B occupancies if:

1. The building has an occupant load of 500 or more persons;
2. The building has an occupant load of more than 100 persons above or below the lowest level of exit discharge; or
3. The building contains an ambulatory care facility.

When automatic sprinkler systems or automatic fire detectors are installed in ambulatory care facilities, such systems or detectors shall be connected to the building fire alarm system.

Exception: In other than ambulatory care facilities, a fire alarm system is not required when an approved automatic fire-extinguishing system is installed throughout the building.

907.2.2.1 Initiation.

Initiation of the fire alarm system shall be by automatic means. Approved automatic fire detectors shall be provided in boiler and furnace rooms, shops, kitchens, mechanical and electrical rooms, trashcollection rooms, storage rooms and similar areas. In ambulatory care facilities, initiation of the fire alarm system shall also be by manual means.

907.2.2.2 Notification.

Activation of the fire alarm system shall initiate a general evacuation signal.

Exception: In lieu of audible notification appliances, visible notification appliances shall be permitted to be used in patient care areas.

907.2.2.3 Ambulatory care facilities.

Corridors and rooms or spaces open to corridors within an ambulatory care facility shall be protected by an automatic smokedetection system.

907.2.3 Group E.

A fire alarm system shall be installed in accordance withSections 907.2.3 through 907.2.3.3 in Group E occupancies having an occupant load of 50 or more.

907.2.3.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be provided in laundry rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, laboratories, kitchens, locker rooms, custodial closets, trash-collection rooms, storage rooms, lounges, and similar areas.

Exception: In buildings protected throughout by an approved automatic sprinkler system or having an approved fire alarm system equipped with corridor smoke detection, manual fire alarm boxes are only required in any main office and in any custodial area.

907.2.3.2 Travel through adjoining rooms.

Where the only means of egress travel from an interior room or rooms having an aggregate occupant load of more than 10 occupants is through an adjoining or intervening room, automatic smoke detectors shall be installed throughout the common atmosphere through which the path of egress travel passes.

Exception: In buildings that are protected throughout by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, smoke detectors are not required in intervening or adjoining rooms.

907.2.3.3 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6.

Exception: An emergency voice/alarm communication system is not required in Group E occupancies with occupant loads of 100 or less, as long as the activation of the fire alarm system or automatic sprinkler system in those occupancies initiates a general evacuation signal.

907.2.4 Group F, general.

A fire alarm system shall be installed in accordance with Sections 907.2.4 through 907.2.4.2 in Group F occupancies that are two or more stories in height and have an occupant load of 500 or more above or below the lowest level of exit discharge.

Exception: A fire alarm system is not required when an approved automatic fire-extinguishing system is installed throughout the building.

907.2.4.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be provided in boiler and furnace rooms, trash-collection rooms, kitchens, mechanical and electrical rooms, and similar areas.

907.2.4.2 Notification.

Activation of the fire alarm system shall initiate a general evacuation signal.

907.2.5 Group H, general.

A fire alarm system shall be installed in accordance with Sections 907.2.5 through 907.2.5.2 in Group H-5 occupancies, occupancies used for the manufacture of organic coatings and, when required by Chapters 60, 62, and 63, at the following locations:

1. Rooms or areas where highly toxic compressed gases are stored or used;
2. Rooms or areas where Class I, II, or III organic peroxides are stored; and
3. Liquid and solid oxidizer storage areas.

907.2.5.1 Initiation.

Initiation of the fire alarm system in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings shall be by manual means. Initiation of fire alarm systems installed for highly toxic gases, organic peroxides, and oxidizers shall be by automatic means, as specified in Chapters 60, 62, and 63.

907.2.5.2 Notification.

Activation of the fire alarm system in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings shall initiate a general evacuation signal. Activation of the automatic detection systems installed for highly toxic gases, organic peroxides, and oxidizers shall sound a local alarm.

907.2.6 Group I, general.

A fire alarm system shall be installed in accordance with Sections 907.2.6.1 through 907.2.6.4.2 in Group I occupancies.

907.2.6.1 Group I-1 occupancies, general.

A manual and automatic fire alarm system shall be installed in Group I-1 occupancies in accordance with Sections 907.2.6.1.1 through 907.2.6.1.3.

907.2.6.1.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be installed in laundry and soiled linen rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, laboratories, kitchens, locker rooms, custodial closets, trash-collection rooms, storage rooms, lounges, gift shops, and similar areas. Automatic smoke detectors shall be provided in corridors and areas that are open to corridors.

Exception: Manual fire alarm boxes in patient sleeping areas of Group I-1 occupancies shall not be required at exits if located at all nurses' stations or other constantly attended staff locations, provided

such fire alarm boxes are visible and continuously accessible and provided that travel distances required by Section 907.4.2 are not exceeded.

907.2.6.1.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal. In addition, activation of the fire alarm system shall immediately transmit an alarm to an approved central station or remote station service.

Exceptions:

1. In lieu of audible notification appliances, visible notification appliances shall be allowed to be used in critical care areas.
2. Where occupants are incapable of evacuating themselves because of age, physical/mental disabilities or physical restraint, only the attendants or other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified. This notification shall include means to readily identify the zone, area, floor, or building in need of evacuation.

907.2.6.1.3 Sleeping room smoke alarms.

Smoke alarms shall be installed in resident sleeping rooms in accordance withSection 907.2.10.2.

907.2.6.2 Group I-2 occupancies, general.

A manual and automatic fire alarm system shall be installed in Group I-2 occupancies in accordance with Sections 907.2.6.2.1 through 907.2.6.2.4.

907.2.6.2.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be installed in laundry and soiled linen rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, laboratories, kitchens, locker rooms, custodial closets, trash-collection rooms, storage rooms, lounges, gift shops, and similar areas. Hospitals, nursing homes (both intermediate care and skilled nursing facilities), board and care homes, and detoxification facilities shall be provided with smoke detection throughout the corridor and areas open to the corridors, other than nurses' stations.

Exceptions:

1. Corridor smoke detection shall not be required where the sleeping room smoke detectors required in Section 907.2.6.2.3 are connected to an approved fire alarm system and activate a general evacuation signal.
2. Manual fire alarm boxes shall not be required at exits from patient sleeping areas if located at all nurses' stations or other constantly attended staff locations, provided such fire alarm boxes are visible and continuously accessible and provided that travel distances horizontally on the same floor shall not exceed 200 feet to reach a manual fire alarm box.

907.2.6.2.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a signal that is distinctive from audible signals used for other purposes in the same building. Such signal is intended to notify staff and need not meet the minimum sound pressure levels required for general evacuation fire alarm notification. In addition, activation of the fire alarm system shall immediately transmit an alarm to an approved central station or remote station service.

Exceptions:

1. In lieu of audible notification appliances, visible notification appliances shall be allowed to be used in critical care areas.
2. Where occupants are incapable of evacuating themselves because of age, physical/mental disabilities, or physical restraint, only the attendants or other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified. This notification shall include means to readily identify the zone, area, floor, or building in need of evacuation.
3. Where total evacuation of occupants is impractical due to building configuration, only the occupants in the affected zones shall be initially notified. Provisions shall be made to selectively notify occupants in other zones to afford orderly evacuation of the entire building.

907.2.6.2.3 Patient room smoke detectors.

Smoke detectors shall be installed in patient sleeping rooms of hospitals and nursing homes. Such detector's primary power shall be other than battery power. Actuation of such detectors shall cause a visual display on the corridor side of the room where the detector is located and shall cause a distinct audible and visual alarm at the nurses' station attending the room. Such detectors may be part of the

facility's fire alarm system, nurses' call system, or a standalone system.

907.2.6.2.3.1 Integral smoke detectors for automatic door-closing devices.

Integral smoke detectors for automatic door-closing devices on sleeping room doors can be installed only if they also meet all of the requirements in Section 907.2.6.2.3.

907.2.6.2.4 Sleeping room smoke alarms.

For Group I-2 facilities, other than hospitals and nursing homes, single station smoke alarms shall be installed in resident sleeping rooms.

907.2.6.3 Group I-3 occupancies, general.

A manual and automatic fire alarm system shall be installed in Group I-3 occupancies in accordance with Sections 907.2.6.3.1 through 907.2.6.3.4.

907.2.6.3.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be installed in laundry and soiled linen rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, laboratories, kitchens, locker rooms, custodial closets, trash-collection rooms, storage rooms, lounges, gift shops, commissaries, and similar areas. Actuation of an automatic fire-extinguishing system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal, which automatically notifies staff. Presignal systems shall not be used.

907.2.6.3.2 Manual fire alarm boxes.

Manual fire alarm boxes are not required to be located in accordance with Section 907.4 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

Manual fire alarm boxes are permitted to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

907.2.6.3.3 Smoke detectors.

An approved automatic smoke-detection system shall be installed throughout resident housing areas, including sleeping areas and contiguous day rooms, group activity spaces, and other common spaces normally accessible to residents.

Exceptions:

1. Other approved smoke-detection arrangements providing equivalent protection, such as placing detectors in exhaust ducts from cells or behind protective grills, are allowed when necessary to prevent damage or tampering.
2. Smoke detectors are not required in sleeping rooms with four or fewer occupants in smoke compartments that are equipped throughout with an approved automatic sprinkler system.

907.2.6.3.4 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a signal that is distinctive from audible signals used for other purposes in the same building. Such signal is intended to notify staff and need not meet the minimum sound pressure levels required for general evacuation fire alarm notification. In addition, activation of the fire alarm system shall immediately transmit an alarm to an approved central station or remote station service.

907.2.6.4 Group I-4 occupancies, general.

A manual and automatic fire alarm system shall be installed in Group I-4 occupancies in accordance with Sections 907.2.6.4.1 through 907.2.6.4.2.

907.2.6.4.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be installed in laundry and soiled linen rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, laboratories, kitchens, locker rooms, custodial closets, trash-collection rooms, storage rooms, lounges, gift shops, and similar areas. Automatic smoke detectors shall be provided in corridors and areas that are open to corridors.

907.2.6.4.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal. In addition, activation of the fire alarm system shall immediately transmit an alarm signal to an approved central station or remote station service.

907.2.7 Group M.

Deleted.

907.2.8 Group R-1, general.

A fire alarm system shall be installed in accordance with Sections 907.2.8.1 through 907.2.8.3 in Group R-1 occupancies.

Exceptions:

1. A fire alarm system is not required in buildings not over two stories in height where all individual sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each sleeping unit has an exit directly to a public way, exit court or yard.
2. Buildings containing five or fewer sleeping units shall be allowed to be equipped with approved multiple-station smoke alarms installed as required for Group R-3 occupancies. Installation shall be in accordance with Section 907.2.10.

907.2.8.1 Initiation.

Initiation of the fire alarm system shall be by automatic means. Approved automatic fire detectors shall be provided in boiler and furnace rooms, shops, laundry and soiled linen rooms, mechanical and electrical rooms, trash-collection rooms, storage rooms, gift shops, kitchens, locker rooms, custodial closets, lounges, and similar areas. Automatic smoke detectors shall be provided in all common areas and interior corridors serving as required means of egress.

Exception: System fire and smoke detectors are not required when an approved automatic fire-extinguishing system is installed in accordance with Section 903.3.1.1 or 903.3.1.2 and a manual fire alarm box is provided at a constantly attended location. When a constantly attended location is not provided, the manual fire alarm box shall be provided at the main exit.

907.2.8.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal.

907.2.8.3 Sleeping unit smoke alarms.

Sleeping unit smoke alarms required by Section 907.2.10 shall not be connected to a fire alarm system.

Exception: Connection of such alarms for annunciation only.

907.2.9 Groups R-2 and R-4, general.

Fire alarm systems and smoke alarms shall be installed in Group R-2 and Group R-4 occupancies. Group R-2 occupancies shall comply with Sections 907.2.9.1 through 907.2.9.1.3. Group R-4 occupancies shall comply with Sections 907.2.9.2 through 907.2.9.2.3.

907.2.9.1 Group R-2, general.

A fire alarm system shall be installed in accordance with Sections 907.2.9.1 through 907.2.9.1.2 in Group R-2 occupancies where:

1. Any sleeping unit or dwelling unit is located two or more stories above the story containing the lowest level of exit discharge;
2. Any sleeping unit or dwelling unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit;
3. The building contains more than 16 dwelling units or sleeping units; or
4. The building is used as a congregate living facility, dormitory, convent, monastery, fraternity, sorority, group home, or shelter and has an occupant load of 20 or more.

Exception: A fire alarm system is not required in buildings not over two stories in height where all dwelling units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each dwelling unit has an exit directly to a public way, exit court, or yard.

907.2.9.1.1 Initiation.

Initiation of the fire alarm system shall be by automatic means. Automatic fire detectors shall be provided in boiler and furnace rooms, trash-collection rooms, shops, laundry rooms, common kitchens, locker rooms, lounges, mechanical and electrical rooms, storage rooms and similar areas. Automatic smoke detectors shall be provided in all common areas and interior corridors serving as a required means of egress.

Exception: System fire and smoke detectors are not required when an approved automatic fireextinguishing system is installed throughout the building.

907.2.9.1.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal.

907.2.9.1.3 Dwelling unit smoke alarms.

Dwelling unit smoke alarms required by Section 907.2.10 shall not be connected to the building fire alarm system.

Exception: Connection of such alarms for annunciation only.

907.2.9.2 Group R-4, general.

A fire alarm system shall be installed in accordance with Sections 907.2.9.2.1 through 907.2.9.2.3 in Group R-4 occupancies.

Exceptions:

1. A fire alarm system is not required in buildings two stories or less in height where all individual sleeping units and attic and crawl spaces contiguous to those units are separated from each other and public or common areas by at least one-hour fire partitions and each sleeping unit room has an exit directly to a public way, exit court, or yard.
2. Buildings containing five or fewer sleeping units are permitted to be equipped with approved multiple-station smoke alarms installed as required for Group R-3 occupancies. Installation shall be in accordance with Section 907.2.10.

907.2.9.2.1 Initiation.

Initiation of the fire alarm system shall be by automatic means. Approved automatic fire detectors shall be provided in boiler and furnace rooms, shops, laundry rooms and soiled linen rooms, mechanical and electrical rooms, common kitchens, lounges, mechanical and electrical rooms, trash-collection rooms, storage rooms, gift shops, locker rooms, and similar areas. Automatic smoke detectors shall be provided in all common areas and interior corridors serving as required means of egress.

Exception: System fire and smoke detectors are not required when an approved automatic fireextinguishing system is installed in accordance with Section 903.3.1.1, 903.3.1.2, or 903.3.1.3.

907.2.9.2.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal.

907.2.9.2.3 Smoke alarms.

Single- and multiplestation smoke alarms shall be installed in accordance with Section 907.2.10.

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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 Sections 907.2.10.1 through 907.2.10.7 and NFPA 72.

907.2.10.1 Group R-1.

Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the *means of egress* from the sleeping area to the door leading from the *sleeping unit*.
3. In each story within the *sleeping unit*, including *basements*. For *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.10.2 Groups R-2, R-3, R-4 and I-1.

Single or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of *occupant load* at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.
3. In each story within a *dwelling unit*, including *basements* but not including crawl spaces and uninhabitable attics. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.10.3 Installation near cooking appliances.

Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.10.1 or 907.2.10.2:

1. Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.
2. Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.
3. Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.

907.2.10.4 Installation near bathrooms.

Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section 907.2.10.1 or 907.2.10.2.

907.2.10.5 Interconnection.

Where more than one smoke alarm is required to be installed within an individual *dwelling unit* or *sleeping unit* in Group R or I-1 occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

907.2.10.6 Power source.

In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system in accordance with Section 1203. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system that complies with Section 604.

907.2.10.7 Smoke detection system.

Smoke detectors listed in accordance with UL 268 and provided as part of the building fire alarm system shall be an acceptable alternative to single- and multiple-station *smoke alarms* and shall comply with the following:

1. The fire alarm system shall comply with all applicable requirements in Section 907.
2. Activation of a smoke detector in a *dwelling unit* or *sleeping unit* shall initiate alarm notification in the *dwelling unit* or *sleeping unit* in accordance with Section 907.5.2.
3. Activation of a smoke detector in a *dwelling unit* or *sleeping unit* shall not activate alarm notification appliances outside of the *dwelling unit* or *sleeping unit*, provided that a supervisory signal is generated and monitored in accordance with Section 907.6.6.

907.2.11 Special amusement buildings.

An automatic smoke detection system shall be provided in special amusement buildings in accordance with Sections 907.2.11.1 through 907.2.11.3.

907.2.11.1 Alarm.

Activation of any single smoke detector, the *automatic sprinkler system* or any other automatic fire detection device shall immediately activate an audible and visible alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.11.2.

907.2.11.2 System response.

The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the *automatic sprinkler system* or other *approved* fire detection device shall automatically do all of the following:

1. Cause illumination of the *means of egress* with light of not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop any conflicting or confusing sounds and visual distractions.
3. Activate an *approved* directional *exit* marking that will become apparent in an emergency.
4. Activate a prerecorded message, audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinctive from other sounds used during normal operation.

907.2.11.3 Emergency voice/alarm communication system.

An emergency voice/alarm communication system, which is allowed to serve as a public address system, shall be installed in accordance with Section 907.5.2.2 and be audible throughout the entire special amusement building.

907.2.12 High-rise buildings.

High-rise buildings shall be provided with an automatic smoke detection system in accordance with Section 907.2.12.1, a fire department communication system in accordance with Section 907.2.12.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.21 of this code and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.5 of the *International Building Code*.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *International Building Code*.
4. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415 of the *International Building Code*.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and occupant notification shall be broadcast by the emergency voice/alarm communication system.

907.2.12.1 Automatic smoke detection.

Automatic smoke detection in high-rise buildings shall be in accordance with Sections 907.2.12.1.1 and 907.2.12.1.2.

907.2.12.1.1 Area smoke detection.

Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall activate the emergency voice/alarm communication system in accordance with Section 907.5.2.2. In addition to smoke detectors required by Sections 907.2.1 through 907.2.9, smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room that is not provided with sprinkler protection.
2. In each elevator machine room, machinery space, control room and control space and in elevator lobbies.

907.2.12.1.2 Duct smoke detection.

Duct smoke detectors complying with Section 907.3.1 shall be located as follows:

1. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
2. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m^3/s) and serving not more than 10 air-inlet openings.

907.2.12.2 Fire department communication system.

Where a wired communication system is *approved* in lieu of an emergency responder radio coverage system in accordance with Section 510, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 and shall operate between a *fire command center* complying with Section 508, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside *interior exit stairways*. The fire department communication device shall be provided at each floor level within the *interior exit stairway*.

907.2.12.3 Multiple-channel voice evacuation.

In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, voice evacuation systems for high-rise buildings shall be multiple-channel systems.

907.2.13 Atriums connecting more than two stories.

A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories, with smoke detection in locations required by a rational analysis in Section 909.4 and in accordance with the system operation

requirements in Section 909.17. The system shall be activated in accordance with Section 907.5. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.5.2.2.

907.2.14 High-piled combustible storage areas.

An automatic smoke detection system shall be installed throughout *high-piled combustible storage* areas where required by Section 3206.5.

907.2.15 Aerosol storage uses.

Aerosol product rooms and general-purpose warehouses containing aerosol products shall be provided with an *approved* manual fire alarm system where required by this code.

907.2.16 Lumber, wood structural panel and veneer mills.

Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

907.2.17 Underground buildings with smoke control systems.

Where a smoke control system is installed in an underground building in accordance with the *International Building Code*, automatic smoke detectors shall be provided in accordance with Section 907.2.17.1.

907.2.17.1 Smoke detectors.

Not fewer than one smoke detector *listed* for the intended purpose shall be installed in all of the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a *listed* smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m^3/s) and serving not more than 10 air inlet openings.

907.2.17.2 Alarm required.

Activation of the smoke control system shall activate an audible alarm at a constantly attended location.

907.2.18 Deep underground buildings.

Where the lowest level of a structure is more than 60 feet (18 288 mm) below the finished floor of the lowest *level of exit discharge*, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

907.2.19 Covered and open mall buildings.

Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. *Access* to emergency voice/alarm communication systems serving a mall, required or otherwise, shall be provided for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

907.2.20 Residential aircraft hangars.

Not fewer than one single-station smoke alarm shall be installed within a residential aircraft hangar as defined in Chapter 2 of the *International Building Code* and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm that will be audible in all sleeping areas of the *dwelling*.

907.2.21 Airport traffic control towers.

An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in airport control towers in accordance with Sections 907.2.21.1 and 907.2.21.2.

Exception: Audible appliances shall not be installed within the control tower cab.

907.2.21.1 Airport traffic control towers with multiple exits and automatic sprinklers.

Airport traffic control towers with multiple *exits* and equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be provided with smoke detectors in all of the following locations:

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Outside each opening into *interior exit stairways*.
5. Along the single *means of egress* permitted from observation levels.

6. Outside each opening into the single *means of egress* permitted from observation levels.

907.2.21.2 Other airport traffic control towers.

Airport traffic control towers with a single *exit* or where sprinklers are not installed throughout shall be provided with smoke detectors in all of the following locations:

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.
6. *Means of egress*.
7. Utility shafts where *access* to smoke detectors can be provided.

907.2.22 Battery rooms.

An automatic smoke detection system shall be installed in areas containing stationary storage battery systems as required in Section 1206.2.

907.2.23 Capacitor energy storage systems.

An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 1206.3.

907.2.24 Residential hospices.

A fire alarm system shall be installed in accordance with Sections 907.2.24.1 and 907.2.24.2 in residential hospices. When automatic sprinkler systems or automatic fire detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

907.2.24.1 Initiation.

Initiation of the fire alarm system shall be by manual and automatic means. Approved automatic fire detectors shall be provided in boiler and furnace rooms, kitchens, laboratories, shops, gift shops, commissaries, laundry and soiled linen rooms, mechanical and electrical rooms, locker rooms, storage rooms, custodial closets, trash-collection rooms, lounges, and similar areas. Automatic smoke detectors shall be provided in sleeping rooms, corridors, and spaces open to the corridors.

Exception: Manual fire alarm boxes are not required at exits if manual fire alarm boxes are located at all nurses' stations or other constantly attended staff locations, provided such fire alarm boxes are visible and continuously accessible and that travel distances required by Section 907.4.2 are not exceeded.

907.2.24.2 Notification.

Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal. In addition, the fire alarm system shall be monitored by an approved central station service in accordance with Section 903.4.1.

Exception: In lieu of audible notification appliances, visible notification appliances shall be allowed to be used in sleeping areas.

907.3 Fire safety functions.

Automatic fire detectors required by Section 907.2 and Chapter 11 are to activate notification appliances in accordance with those sections. When automatic fire detectors are installed for other fire safety functions, they shall perform the intended function upon activation. When automatic detectors are installed for fire safety functions and the building has a fire alarm system, the detectors shall activate supervisory signals at the fire alarm control panel or at a constantly attended location. When the building does not have a fire alarm system, the detectors shall activate a visual and audible supervisory signal at an approved location, which shall indicate the source of the signal.

907.3.1 Air distribution and air-handling systems.

Smoke detectors installed to shut down the air distribution or air-handling system shall, upon activation, perform the intended function. Air distribution or air-handling equipment that is part of a smoke-control system shall switch to smoke-control mode upon activation of a detector.

907.3.1.1 Fire alarm system interface.

Smoke detectors that are installed in air distribution or air-handling systems for shutdown purposes and that are connected to a fire alarm system shall not sound a general evacuation signal.

907.3.2 Elevator control functions.

Smoke detectors that are installed to control or recall elevators or to control doors for elevators, elevator lobbies, or elevator shafts and that are connected to a fire alarm system shall not sound a general evacuation signal. Elevator

recall and firefighter's emergency operation for elevators shall only be controlled by elevator smoke detectors and shall not initiate upon other building fire detectors or evacuation signals.

907.3.3 Door hold-open functions.

Smoke detectors that are installed to hold open fire doors under nonemergency conditions and that are connected to a fire alarm system shall sound a general evacuation signal when the doors being held open are part of the means of egress corridor or stair system. Door hold-open smoke detectors are not required to activate a visual or audible signal.

907.3.4 Wiring.

The wiring to the auxiliary devices and equipment used to accomplish the fire safety functions shall be monitored for integrity in accordance with NFPA 72.

907.4 Initiating devices.

Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.

907.4.1 Protection of fire alarm control unit.

In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders and supervising station transmitting equipment.

Exception: Where ambient conditions prohibit installation of smoke detector, a *heat detector* shall be permitted.

907.4.2 Manual fire alarm boxes.

Where a manual fire alarm system is required by another section of this code, it shall be activated by fire alarm boxes installed in accordance with Sections 907.4.2.1 through 907.4.2.6.

907.4.2.1 Location.

Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each *exit*. In buildings not protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, additional manual fire alarm boxes shall be located so that the distance of travel to the nearest box does not exceed 200 feet (60 960 mm).

907.4.2.2 Height.

The height of the manual fire alarm boxes shall be not less than 42 inches (1067 mm) and not more than 48 inches (1372 mm) measured vertically, from the floor level to the activating handle or lever of the box.

907.4.2.3 Color.

Manual fire alarm boxes shall be red in color.

907.4.2.4 Signs.

Where fire alarm systems are not monitored by a supervising station, an *approved* permanent sign shall be installed adjacent to each manual fire alarm box that reads: WHEN ALARM SOUNDS—CALL FIRE DEPARTMENT.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

907.4.2.5 Protective covers.

The *fire code official* is authorized to require the installation of *listed* manual fire alarm box protective covers to prevent malicious false alarms or to provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless *approved*. Protective covers shall not project more than that permitted by Section 1003.3.3.

907.4.2.6 Unobstructed and unobscured.

Manual fire alarm boxes shall be provided with *ready access*, unobstructed, unobscured and visible at all times.

907.4.3 Automatic smoke detection.

Where an automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors cannot be utilized due to ambient conditions, *approved* automatic *heat detectors* shall be permitted.

907.4.3.1 Automatic sprinkler system.

For conditions other than specific fire safety functions noted in Section 907.3, in areas where ambient conditions prohibit the installation of smoke detectors, an *automatic sprinkler system* installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 and that is connected to the fire alarm system shall be *approved* as automatic heat detection.

907.5 Occupant notification systems.

A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation, in accordance with Sections 907.5.1 through 907.5.2.3.3. Where a fire alarm system is required by another section of this code, it shall be activated by:

1. Automatic fire detectors.
2. Automatic sprinkler system waterflow devices.
3. Manual fire alarm boxes.
4. Automatic fire-extinguishing systems.

Exception: Where notification systems are allowed elsewhere in Section 907 to annunciate at a constantly attended location.

907.5.1 Presignal feature.

A presignal feature shall not be installed unless *approved* by the *fire code official*. Where a presignal feature is provided, a signal shall be annunciated at a constantly attended location *approved* by the *fire code official*, so that occupant notification can be activated in the event of fire or other emergency.

907.5.2 Alarm notification appliances.

Alarm notification appliances shall be provided and shall be *listed* for their purpose.

907.5.2.1 Audible alarms.

Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

Exceptions:

1. Audible alarm notification appliances are not required in critical care areas of Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
2. A visible alarm notification appliance installed in a nurses' control station or other continuously attended staff location in a Group I-2, Condition 2 suite shall be an acceptable alternative to the installation of audible alarm notification appliances throughout the suite in Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
3. Where provided, audible notification appliances located in each enclosed occupant evacuation elevator lobby in accordance with Section 3008.9.1 of the *International Building Code* shall be connected to a separate notification zone for manual paging only.

907.5.2.1.1 Average sound pressure.

The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of not less than 60 seconds, whichever is greater, in every occupiable space within the building.

907.5.2.1.2 Maximum sound pressure.

Fire alarm system audibility levels shall not exceed 35 dB above the average ambient sound level described in Section 907.5.2.1.1 or 35 dB above the peak ambient sound level. The maximum sound pressure level for audible alarm notification appliances shall be 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 95 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

907.5.2.2 Emergency voice/alarm communication systems.

Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. The operation of any automatic fire detector, sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving *approved* information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by Section 404. In high-rise buildings, the system shall operate on at least the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. *Interior exit stairways*.
3. Each floor.
4. *Areas of refuge* as defined in Chapter 2.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a

general occupant notification shall be broadcast over the overhead page.

907.5.2.2.1 Manual override.

A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

907.5.2.2.2 Live voice messages.

The emergency voice/alarm communication system shall have the capability to broadcast live voice messages by paging zones on a selective and all-call basis.

907.5.2.2.3 Alternative uses.

The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided that the manual fire alarm use takes precedence over any other use.

907.5.2.2.4 Emergency voice/alarm communication captions.

Where stadiums, arenas and grandstands have 15,000 fixed seats or more and provide audible public announcements, the emergency/voice alarm communication system shall provide prerecorded or real-time captions. Prerecorded or live emergency captions shall be from an*approved* location constantly attended by personnel trained to respond to an emergency.

907.5.2.2.5 Emergency power.

Emergency voice/alarm communications systems shall be provided with emergency power in accordance with Section 1203. The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in NFPA 72.

907.5.2.3 Visible alarms.

Visible alarm notification appliances shall be provided in accordance withSections 907.5.2.3.1 through 907.5.2.3.3.

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 Chapter 2.
3. Visible alarm notification appliances shall not be required in elevator cars.
4. Visual alarm notification appliances are not required in critical care areas of Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.

907.5.2.3.1 Public use areas and common use areas.

Visible alarm notification appliances shall be provided in*public use areas* and *common use areas*.

Exception: Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with not less than 20-percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing-impaired employee(s).

907.5.2.3.2 Groups I-1 and R-1.

Habitable spaces in dwelling units and sleeping units in Group I-1 and R-1 occupancies in accordance with Table 907.5.2.3.2 shall be provided with visible alarm notification. Visible alarms shall be activated by the in-room smoke alarm and the building fire alarm system.

TABLE 907.5.2.3.2
VISIBLE ALARMS

NUMBER OF SLEEPING UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE 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

907.5.2.3.3 Group R-2.

In Group R-2 occupancies required by Section 907 to have a fire alarm system, each *story* that contains *dwelling units* and *sleeping units* shall be provided with the future capability to support visible alarm notification appliances in accordance with Chapter 11 of ICC A117.1. Such capability shall accommodate wired or wireless equipment. The future capability shall include one of the following:

1. The interconnection of the building fire alarm system with the unit smoke alarms.
2. The replacement of audible appliances with combination audible/visible appliances.
3. The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

907.6 Installation and monitoring.

A fire alarm system shall be installed and monitored in accordance with Sections 907.6.1 through 907.6.6.2 and NFPA 72.

907.6.1 Wiring.

Wiring shall comply with the requirements of NFPA 70 and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

907.6.2 Power supply.

The primary and secondary power supply for the fire alarm system shall be provided in accordance with NFPA 72.

Exception: Backup power for single-station and multiple-station smoke alarms as required in Section 907.2.10.6.

907.6.3 Initiating device identification.

The fire alarm system shall identify the specific initiating device address, location, device type, floor level where applicable and status including indication of normal, alarm, trouble and supervisory status, as appropriate.

Exceptions:

1. Fire alarm systems in single-story buildings less than 22,500 square feet (2090 m^2) in area.
2. Fire alarm systems that only include manual fire alarm boxes, waterflow initiating devices and not more than 10 additional alarm-initiating devices.
3. Special initiating devices that do not support individual device identification.
4. Fire alarm systems or devices that are replacing existing equipment.

907.6.3.1 Annunciation.

The initiating device status shall be annunciated at an *approved* on-site location.

907.6.4 Zones.

Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet (2090 m^2). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.

Exception: *Automatic sprinkler system* zones shall not exceed the area permitted by NFPA 13.

907.6.4.1 Zoning indicator panel.

A zoning indicator panel and the associated controls shall be provided in an *approved* location. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible alarm-silencing switch.

907.6.4.2 High-rise buildings.

In high-rise buildings, a separate zone by floor shall be provided for each of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler waterflow devices.
3. Manual fire alarm boxes.
4. Other *approved* types of automatic fire detection devices or suppression systems.

907.6.5 Access.

Access shall be provided to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.

907.6.6 Monitoring.

Where provided, monitoring of fire alarm systems shall comply with Sections 907.6.6.1 and 907.6.6.2.

907.6.6.1 Automatic telephone-dialing devices.

Automatic telephone-dialing devices used to transmit an emergency alarm shall not be connected to any fire department telephone number unless *approved* by the fire chief.

907.6.6.2 Termination of monitoring service.

Termination of fire alarm monitoring services shall be in accordance with Section 901.9.

907.7 Acceptance tests and completion.

Upon completion of the installation, the fire alarm system and all fire alarm components shall be tested in accordance with NFPA 72.

907.7.1 Single- and multiple-station alarm devices.

When the installation of the alarm devices is complete, each device and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the smoke alarm provisions of NFPA 72.

907.7.2 Record of completion.

A record of completion in accordance with NFPA 72 verifying that the system has been installed and tested in accordance with the *approved* plans and specifications shall be provided.

907.7.3 Instructions.

Operating, testing and maintenance instructions and record drawings (“as builts”) and equipment specifications shall be provided at an *approved* location.

907.8 Inspection, testing and maintenance.

The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Sections 907.8.1 through 907.8.5 and NFPA 72. Records of inspection, testing and maintenance shall be maintained.

907.8.1 Maintenance required.

Where required for compliance with the provisions of this code, devices, equipment, systems, conditions, arrangements, levels of protection or other features shall thereafter be continuously maintained in accordance with applicable NFPA requirements or as directed by the *fire code official*.

907.8.2 Testing.

Fire alarm systems shall be inspected and tested at least annually in accordance with NFPA 72 or more frequently where required by the code official.

Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the code official, but not less than every 18 months.

907.8.3 Smoke detector sensitivity.

Smoke detector sensitivity shall be checked within one year after installation and every alternate year thereafter. After the second calibration test, where sensitivity tests indicate that the detector has remained within its *listed* and marked sensitivity range (or 4-percent obscuration light gray smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to not more than 5 years. Where the frequency is extended, records of detector-caused nuisance alarms and subsequent trends of these alarms shall be maintained. In zones or areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.

907.8.4 Sensitivity test method.

To verify that each smoke detector is within its *listed* and marked sensitivity range, it shall be tested using one of the following methods:

1. A calibrated test method.
2. The manufacturer’s calibrated sensitivity test instrument.
3. *Listed* control equipment arranged for the purpose.
4. A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where the detector’s sensitivity is outside its acceptable sensitivity range.
5. Another calibrated sensitivity test method acceptable to the *fire code official*.

Detectors found to have a sensitivity outside the *listed* and marked sensitivity range shall be cleaned and recalibrated or replaced.

Exceptions:

1. Detectors *listed* as field adjustable shall be permitted to be either adjusted within the *listed* and marked sensitivity range and cleaned and recalibrated or they shall be replaced.
2. This requirement shall not apply to single-station smoke alarms.

907.8.4.1 Sensitivity testing device.

Smoke detector sensitivity shall not be tested or measured using a device that administers an unmeasured concentration of smoke or other aerosol into the detector.

907.8.5 Inspection, testing and maintenance.

The building *owner* shall be responsible to maintain the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for inspection, testing and maintenance of such systems. Records of inspection, testing and maintenance shall be maintained.

907.9 Where required in existing buildings and structures.

An *approved* fire alarm system shall be provided in existing buildings and structures where required in Chapter 11.

907.10 Smoke alarm maintenance.

Smoke alarms shall be tested and maintained in accordance with the manufacturer's instructions. Smoke alarms shall be replaced when they fail to respond to operability tests, or when they exceed 10 years from the date of manufacture, unless an earlier replacement is specified in the manufacturer's published instructions.

SECTION 908
EMERGENCY ALARM SYSTEMS

908.1 Group H occupancies.

Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as required in Chapter 50.

908.2 Group H-5 occupancy.

Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 2703.12.

Relocated

SECTION 909
SMOKE CONTROL SYSTEMS

909.1 Scope and purpose.

This section applies to mechanical or passive smoke control systems when they are required for new buildings or portions thereof by provisions of this code or the Building Code. The purpose of this section is to establish minimum requirements for the design, installation, and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants and for fire suppression and overhaul efforts. These provisions are not intended for the preservation of contents or the timely restoration of operations.

909.2 General design requirements.

Buildings, structures, or parts thereof required by the*International Building Code* or this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The *construction documents* shall include sufficient information and detail to describe adequately the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied with sufficient information and analysis to demonstrate compliance with these provisions.

909.3 Special inspection and test requirements.

In addition to the ordinary inspection and test requirements that buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the *construction documents* shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved. The special inspections and tests required by this section shall be conducted under the same terms as in Section 1704 of the *International Building Code*.

909.4 Analysis.

A rational analysis supporting the types of smoke control systems to be employed, the methods of their operations, the systems supporting them and the methods of construction to be utilized shall accompany the *construction documents* submission and include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.7.

909.4.1 Stack effect.

The system shall be designed such that the maximum probable normal or reverse stack effect will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.

909.4.2 Temperature effect of fire.

Buoyancy and expansion caused by the design fire in accordance withSection 909.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.

909.4.3 Wind effect.

The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of the *International Building Code*.

909.4.4 Systems.

The design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the heating, ventilating and air-conditioning systems.

909.4.5 Climate.

The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

909.4.6 Duration of operations.

All portions of the active or passive smoke control system shall be capable of continued operation after detection of the fire event for a period of not less than 20 minutes. System design shall be for 20 minutes; however, fans shall continue to operate after 20 minutes and shall continue to operate automatically for smoke removal during fire suppression and overhaul efforts for a minimum of 5 minutes for every 10 feet vertically of protected space.

909.4.7 Smoke control system interaction.

The design shall consider the interaction effects of the operation of multiple smoke control systems for all design scenarios.

909.4.8 Door opening force.

With any of the design methods allowed by Section 909, the door opening force, latch release, and set-in-motion force shall comply with Section 1010.1.3 requirements when the system is in smoke control mode.

909.5 Smoke barrier construction.

Smoke barriers required for passive smoke control and a smoke control system using the pressurization method shall comply with Section 709 of the *International Building Code*. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls: $A/A_W = 0.00100$
2. Interior *exit stairways* and *ramps* and *exit passageways*: $A/A_W = 0.00035$
3. Enclosed *exit access stairways* and *ramps* and all other shafts: $A/A_W = 0.00150$
4. Floors and roofs: $A/A_F = 0.00050$

where:

A = Total leakage area, square feet (m^2).

A_F = Unit floor or roof area of barrier, square feet (m^2).

A_W = Unit wall area of barrier, square feet (m^2).

The leakage area ratios shown do not include openings due to gaps around doors and operable windows. The total leakage area of the *smoke barrier* shall be determined in accordance with Section 909.5.1 and tested in accordance with Section 909.5.2.

909.5.1 Total 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 around doors and operable windows.

909.5.2 Testing of leakage area.

Compliance with the maximum total leakage area 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 utilizing the pressurization method. Compliance with the maximum total leakage area of passive smoke control systems shall be verified through methods such as door fan testing or other methods, as *approved* by the *fire code official*.

909.5.3 Opening protection.

Openings in *smoke barriers* shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with Section 716 of the *International Building Code*.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors *listed* for releasing service installed in accordance with Section 907.3.
2. Fixed openings between smoke zones that are protected utilizing the airflow method.
3. In Group I-1, Condition 2; Group I-2; and ambulatory care facilities, where a pair of opposite-swinging doors are installed across a corridor in accordance with Section 909.5.3.1, the doors shall not be required to be protected in accordance with Section 716 of the *International Building Code*. The doors shall be close-fitting within operational tolerances and shall not have a center mullion or undercuts in excess of $^3/_4$-inch (19.1 mm) louvers or grilles. The doors shall have head and jamb stops and astragals or rabbets at meeting edges and, where permitted by the door manufacturer's listing, positive-latching devices are not required.
4. In Group I-2 and ambulatory care facilities, where such doors are special-purpose horizontal sliding, accordion or folding door assemblies installed in accordance with Section 1010.1.4.3 and are automatic closing by smoke detection in accordance with Section 716.2.6.6 of the *International Building Code*.
5. Group I-3.
6. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.

909.5.3.1 Group I-1, Condition 2; Group I-2; and ambulatory care facilities.

In Group I-1, Condition 2; Group I-2; and *ambulatory care facilities*, where doors are installed across a *corridor*, the doors shall be automatic closing by smoke detection in accordance with Section 716.2.6.6 of the *International Building Code* and shall have a vision panel with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested.

909.5.3.2 Ducts and air transfer openings.

Ducts and air transfer openings are required to be protected with a minimum Class II, 250°F (121°C) smoke damper complying with Section 717 of the *International Building Code*.

909.6 Pressurization method.

The primary mechanical means of controlling smoke shall be by pressure differences across *smoke barriers*. Maintenance of a tenable environment is not required in the smoke-control zone of fire origin.

909.6.1 Minimum pressure difference.

The pressure difference across a *smoke barrier* used to separate smoke zones shall be not less than 0.05-inch water gage (0.0124 kPa) in fully sprinklered buildings.

In buildings permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences not less than two times the maximum calculated pressure difference produced by the design fire.

909.6.2 Maximum pressure difference.

The maximum air pressure difference across a *smoke barrier* shall be determined by required door-opening or closing forces. The actual force required to open *exit* doors when the system is in the smoke control mode shall be in accordance with Section 1010.1.3. Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by:

$$F = F_{dc} + K(WA\Delta P)/2(W - d) \quad \text{(Equation 9-1)}$$

where:

A = Door area, square feet (m^2).
d = Distance from door handle to latch edge of door, feet (m).
F = Total door opening force, pounds (N).
F_{dc} = Force required to overcome closing device, pounds (N).
K = Coefficient 5.2 (1.0).
W = Door width, feet (m).
ΔP = Design pressure difference, inches of water (Pa).

909.6.3 Pressurized stairways and elevator hoistways.

Where stairways or elevator hoistways are pressurized, such pressurization systems shall comply with Section 909 as smoke control systems, in addition to the requirements of Section 909.21 of this code and Section 909.20 of the *International Building Code*.

909.7 Airflow design method.

Where *approved* by the *fire 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. Smoke control systems using the airflow method shall be designed in accordance with NFPA 92.

909.7.1 Prohibited conditions.

This method shall not be employed where either the quantity of air or the velocity of the airflow will adversely affect other portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics or interfere with exiting. Airflow toward the fire shall not exceed 200 feet per minute (1.02 m/s). Where the calculated airflow exceeds this limit, the airflow method shall not be used.

909.8 Exhaust method.

Where *approved* by the *fire 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 92.

909.8.1 Smoke layer.

The height of the lowest horizontal surface of the smoke layer interface shall be maintained not less than 6 feet (1829 mm) above a walking surface that forms a portion of a required egress system within the smoke zone.

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 code official*. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

909.9.1 Factors considered.

The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire and

whether the fire is likely to be steady or unsteady.

909.9.2 Design fire fuel.

Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

909.9.3 Heat-release assumptions.

The analysis shall make use of best available data from*approved* sources and shall not be based on excessively stringent limitations of combustible material.

909.9.4 Sprinkler effectiveness assumptions.

A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.

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 code official*.

909.10.1 Exhaust fans.

Components of exhaust fans shall be rated and certified by the manufacturer for the probable temperature rise to which the components will be exposed. This temperature rise shall be computed by:

$$T_s = (Q_c/mc) + (T_a) \quad \text{(Equation 9-2)}$$

where:

c = Specific heat of smoke at smoke layer temperature, Btu/lb°F · (kJ/kg • K).

m = Exhaust rate, pounds per second (kg/s).

Q_C = Convective heat output of fire, Btu/s (kW).

T_a = Ambient temperature, °F (K).

T_S = Smoke temperature, °F (K).

Exception: Reduced T_S as calculated based on the assurance of adequate dilution air.

909.10.2 Ducts.

Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the *International Mechanical Code*. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections, for the purpose of vibration isolation, complying with the*International Mechanical Code* and that are constructed of*approved* fire-resistance-rated materials.

909.10.3 Equipment, inlets and outlets.

Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

909.10.4 Automatic dampers.

Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be *listed* and conform to the requirements of*approved* recognized standards.

909.10.5 Fans.

In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the structural design requirements of Chapter 16 of the *International Building Code*.

Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts) as determined from measurement of actual current draw and shall have a minimum service factor of 1.15.

909.11 Standby power.

Smoke control systems shall be provided with standby power in accordance withSection 1203.

909.11.1 Equipment room.

The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 of the *International Building Code* or horizontal assemblies constructed in accordance with Section 711 of the *International Building Code*, or both.

909.11.2 Power sources and power surges.

Elements of the smoke control system relying on volatile memories or the like shall be supplied with uninterruptable power sources of sufficient duration to span 15-minute primary power interruption. Elements of the smoke control system susceptible to power surges shall be suitably protected by conditioners, suppressors or other *approved* means.

909.12 Detection and control systems.

Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and *listed* as smoke control equipment.

909.12.1 Verification.

Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override and the presence of power downstream of all disconnects. A preprogrammed weekly test sequence shall report abnormal conditions audibly, visually and by printed report. The preprogrammed weekly test shall operate all devices, equipment, and components used for smoke control.

Exception: Where verification of individual components tested through the preprogrammed weekly testing sequence will interfere with, and produce unwanted effects to, normal building operation, such individual components are permitted to be bypassed from the preprogrammed weekly testing, where *approved* by the *fire code official* and in accordance with both of the following:

1. Where the operation of components is bypassed from the preprogrammed weekly test, presence of power downstream of all disconnects shall be verified weekly by a listed control unit.
2. Testing of all components bypassed from the preprogrammed weekly test shall be in accordance with Section 909.20.6.

909.12.2 Wiring.

In addition to meeting requirements of NFPA 70, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

909.12.3 Activation.

Smoke control systems shall be activated in accordance with this section.

909.12.3.1 Pressurization, airflow or exhaust method.

Mechanical smoke control systems using the pressurization, airflow or exhaust method shall have completely automatic control.

909.12.3.2 Passive method.

Passive smoke control systems actuated by *approved* spot-type detectors *listed* for releasing service shall be permitted.

909.12.4 Automatic control.

Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned *automatic sprinkler system* complying with Section 903.3.1.1, manual controls provided with *ready access* for the fire department and any smoke detectors required by the engineering analysis.

909.13 Control air tubing.

Control air tubing shall be of sufficient size to meet the required response times. Tubing shall be flushed clean and dry prior to final connections and shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.

909.13.1 Materials.

Control air tubing shall be hard drawn copper, Type L, ACR in accordance with ASTM B42, ASTM B43, ASTM B68, ASTM B88, ASTM B251 and ASTM B280. Fittings shall be wrought copper or brass, solder type, in accordance with ASME B16.18 or ASME B16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100°F (593°C) and liquidus below 1,500°F (816°C). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices, provided that all

of the following conditions are met:

1. Tubing shall comply with the requirements of Section 602.2.1.3 of the *International Mechanical Code*.
2. Tubing and the connected device shall be completely enclosed within a galvanized or paint-grade steel enclosure having a minimum thickness of 0.0296 inch (0.7534 mm) (No. 22 gage). Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or Teflon or by suitable brass compression to male-barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within the enclosure. Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing connected to devices on doors shall be fastened along hinges.

909.13.2 Isolation from other functions.

Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.

909.13.3 Testing.

Control air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.

909.14 Marking and identification.

The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

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 code official*, the fire department and in the *fire command center* in a format and manner *approved* by the *fire code official*.

909.16 Fire fighter's smoke control panel.

A fire fighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in a *fire command center* complying with Section 508 in high-rise buildings or buildings with smoke-protected assembly seating. In all other buildings, the fire fighter's smoke control panel shall be installed in an *approved* location adjacent to the fire alarm control panel. The fire fighter's smoke control panel shall comply with Sections 909.16.1 through 909.16.3.

909.16.1 Smoke control systems.

Fans within the building shall be shown on the fire fighter's control panel. A clear indication of the direction of airflow and the relationship of components shall be displayed. Status indicators shall be provided for all smoke control equipment, annunciated by fan and zone and by pilot-lamp-type indicators as follows:

1. Fans, dampers and other operating equipment in their normal status—WHITE.
2. Fans, dampers and other operating equipment in their off or closed status—RED.
3. Fans, dampers and other operating equipment in their on or open status—GREEN.
4. Fans, dampers and other operating equipment in a fault status—YELLOW/AMBER.

909.16.2 Smoke control panel.

The fire fighter's control panel shall provide control capability over the complete smoke control system equipment within the building as follows:

1. ON-AUTO-OFF control over each individual piece of operating smoke control equipment that can be controlled from other sources within the building. This includes *stairway* pressurization fans; smoke exhaust fans; supply, return and exhaust fans; elevator shaft fans; and other operating equipment used or intended for smoke control purposes.
2. OPEN-AUTO-CLOSE control over individual dampers relating to smoke control and that are controlled from other sources within the building.
3. ON-OFF or OPEN-CLOSE control over smoke control and other critical equipment associated with a fire or smoke emergency and that can only be controlled from the fire fighter's control panel.

Exceptions:

1. Complex systems, where *approved*, where the controls and indicators are combined to control and indicate all elements of a single smoke zone as a unit.
2. Complex systems, where *approved*, where the control is accomplished by computer interface using *approved*, plain English commands.

909.16.3 Control action and priorities.

The fire fighter's control panel actions shall be as follows:

1. ON-OFF and OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire fighter's control panel, automatic or manual control from any other control point within the building shall not contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment including, but not limited to, duct freezestats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices, such means shall be capable of being overridden by the fire fighter's control panel. The last control action as indicated by each fire fighter's control panel switch position shall prevail. Control actions shall not require the smoke control system to assume more than one configuration at any one time.

   Exception: Power disconnects required by NFPA 70.

2. Only the AUTO position of each three-position firefighter's control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire fighter's control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described in Section 909.16.1. Where directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. Control actions shall not require the smoke control system to assume more than one configuration at any one time.

909.17 System response time.

Smoke-control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. For purposes of smoke control, the fire fighter's control panel response time shall be the same for automatic or manual smoke control action initiated from any other building control point. The total response time, including that necessary for detection, shutdown of operating equipment and smoke control system startup, shall allow for full operational mode to be achieved before the conditions in the space exceed the design smoke condition. The system response time for each component and their sequential relationships shall be detailed in the required rational analysis and verification of their installed condition reported in the required final report.

909.18 Acceptance testing.

Devices, equipment, components and sequences shall be individually tested. These tests, in addition to those required by other provisions of this code, shall consist of determination of function, sequence and, where applicable, capacity of their installed condition.

909.18.1 Detection devices.

Smoke or fire detectors that are a part of a smoke control system shall be tested in accordance with Chapter 9 in their installed condition. Where applicable, this testing shall include verification of airflow in both minimum and maximum conditions.

909.18.2 Ducts.

Ducts that are part of a smoke control system shall be traversed using generally accepted practices to determine actual air quantities.

909.18.3 Dampers.

Dampers shall be tested for function in their installed condition.

909.18.4 Inlets and outlets.

Inlets and outlets shall be read using generally accepted practices to determine air quantities.

909.18.5 Fans.

Fans shall be examined for correct rotation. Measurements of voltage, amperage, revolutions per minute and belt tension shall be made.

909.18.6 Smoke barriers.

Measurements using inclined manometers or other *approved* calibrated measuring devices shall be made of the pressure differences across *smoke barriers*. Such measurements shall be conducted for each possible smoke control condition.

909.18.7 Controls.

Each smoke zone equipped with an automatic-initiation device shall be put into operation by the actuation of one such device. Each additional device within the zone shall be verified to cause the same sequence without requiring the operation of fan motors in order to prevent damage. Control sequences shall be verified throughout the system,

including verification of override from the fire fighter's control panel and simulation of standby power conditions.

909.18.8 Testing for smoke control.

Smoke control systems shall be tested by a special inspector in accordance with Section 1705.18 of the *International Building Code*.

909.18.8.1 Scope of testing.

Testing shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

909.18.8.2 Qualifications.

Approved agencies for smoke control testing shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

909.18.8.3 Reports.

A complete report of testing shall be prepared by the *approved* agency. The report shall include identification of all devices by manufacturer, nameplate data, design values, measured values and identification tag or mark. The report shall be reviewed by the responsible registered design professional and, when satisfied that the design intent has been achieved, the responsible registered design professional shall sign, seal and date the report.

909.18.8.3.1 Report filing.

A copy of the final report shall be filed with the *fire code official* and an identical copy shall be maintained in an *approved* location at the building.

909.18.9 Identification and documentation.

Charts, drawings and other documents identifying and locating each component of the smoke control system, and describing their proper function and maintenance requirements, shall be maintained on file at the building as an attachment to the report required by Section 909.18.8.3. Devices shall have an *approved* identifying tag or mark on them consistent with the other required documentation and shall be dated indicating the last time they were successfully tested and by whom.

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 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 and a written maintenance program complying with the requirements of Section 909.20.1 has been submitted and *approved* by the *fire code official*.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as *approved* by the *fire 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.

909.20 Maintenance.

Smoke control systems and post-fire smoke exhaust systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. The system shall be maintained in accordance with the manufacturer's instructions and Sections 909.20.1 through 909.20.7.

909.20.1 Schedule.

A routine maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests. A written schedule for routine maintenance and operational testing shall be established.

909.20.2 Records.

Records of smoke control system testing and maintenance shall be maintained. The record shall include the date of the maintenance, identification of the servicing personnel and notification of any unsatisfactory condition and the corrective action taken, including parts replaced.

909.20.3 Testing.

Operational testing of the smoke control system shall include all equipment such as initiating devices, fans, dampers, controls, doors and windows.

909.20.4 Dedicated smoke control systems.

Dedicated smoke control systems shall be operated for each control sequence semiannually. The system shall be tested under standby power conditions.

909.20.5 Nondedicated smoke control systems.

Nondedicated smoke control systems shall be operated for each control sequence annually. The system shall be tested under standby power conditions.

909.20.6 Components bypassing weekly test.

Where components of the smoke control system are bypassed by the preprogrammed weekly test required by Section 909.12.1, such components shall be tested semiannually. The system shall be tested under standby power conditions.

909.20.7 Qualifications.

Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering, and certification as air balancers.

[BF] 909.21 Elevator hoistway pressurization alternative.

Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with Sections 909.21.1 through 909.21.11.

[BF] 909.21.1 Pressurization requirements.

Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) and a maximum positive pressure of 0.25 inch of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The pressure differentials shall be measured between the hoistway and the adjacent elevator landing. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

Exceptions:

1. On floors containing only Group R occupancies, the pressure differential is permitted to be measured between the hoistway and a *dwelling unit* or *sleeping unit*.
2. Where an elevator opens into a lobby enclosed in accordance with Section 3007.6 or 3008.6 of the *International Building Code*, the pressure differential is permitted to be measured between the hoistway and the space immediately outside the door(s) from the floor to the enclosed lobby.
3. The pressure differential is permitted to be measured relative to the outdoor atmosphere on floors other than the following:
   3.1. The fire floor.
   3.2. The two floors immediately below the fire floor.
   3.3. The floor immediately above the fire floor.
4. The minimum positive pressure of 0.10 inch of water (25 Pa) and a maximum positive pressure of 0.25 inch of water (67 Pa) with respect to occupied floors is not required at the floor of recall with the doors open.

[BF] 909.21.1.1 Use of ventilation systems.

Ventilation systems, other than hoistway supply air systems, are permitted to be used to exhaust air from adjacent spaces on the fire floor, two floors immediately below and one floor immediately above the fire floor to the building's exterior where necessary to maintain positive pressure relationships as required in Section 909.21.1 during operation of the elevator shaft pressurization system.

[BF] 909.21.2 Rational analysis.

A rational analysis complying with Section 909.4 shall be submitted with the *construction documents*.

[BF] 909.21.3 Ducts for system.

Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator shaft enclosure.

[BF] 909.21.4 Fan system.

The fan system provided for the pressurization system shall be as required by Sections 909.21.4.1 through 909.21.4.4.

[BF] 909.21.4.1 Fire resistance.

Where located within the building, the fan system that provides the pressurization shall be protected with the same *fire-resistance rating* required for the elevator shaft enclosure.

[BF] 909.21.4.2 Smoke detection.

The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

[BF] 909.21.4.3 Separate systems.

A separate fan system shall be used for each elevator hoistway.

[BF] 909.21.4.4 Fan capacity.

The supply fan shall be either adjustable with a capacity of not less than 1,000 cfm (0.4719 m^3/s) per door, or that specified by a *registered design professional* to meet the requirements of a designed pressurization system.

[BF] 909.21.5 Standby power.

The pressurization system shall be provided with standby power in accordance with Section 1203.

[BF] 909.21.6 Activation of pressurization system.

The elevator pressurization system shall be activated upon activation of either the building fire alarm system or the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.

[BF] 909.21.7 Testing.

Testing for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

[BF] 909.21.8 Marking and identification.

Detection and control systems shall be marked in accordance with Section 909.14.

[BF] 909.21.9 Control diagrams.

Control diagrams shall be provided in accordance with Section 909.15.

[BF] 909.21.10 Control panel.

A control panel complying with Section 909.16 shall be provided.

[BF] 909.21.11 System response time.

Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.

909.22 High-rise and covered mall smoke-exhaust systems.

High-rise buildings, not provided with a smoke control or a post-fire smoke exhaust system, shall be equipped with a smoke removal system installed and maintained in accordance with the Building Code. Covered mall buildings exceeding 50,000 square feet (4,645 m^2) in floor area, excluding anchor stores, and not provided with a smoke control system, shall be equipped with a post-fire smoke exhaust system installed and maintained in accordance with the Building Code.

SECTION 910
SMOKE AND HEAT REMOVAL

910.1 General.

Where required by this code, smoke and heat vents or mechanical smoke removal systems shall conform to the requirements of this section.

910.1.1 Required venting method.

Required smoke and heat venting shall be accomplished with mechanical smoke exhaust according to Section 910.4.

Exceptions:

1. Calculated engineering design of mechanical smoke exhaust in accordance with Section 910.5 shall be permitted for buildings sprinklered throughout.
2. For nonsprinklered buildings, smoke and heat vents as specified in Section 910.3 shall be permitted.
3. Where approved by the fire code official, smoke and heat vents as specified in Section 910.3 shall be permitted in sprinklered buildings.

910.1.2 Listing.

Smoke and heat vents and mechanical smoke exhaust fans shall be listed for the intended purpose.

910.1.3 Curtain boards.

When mechanical smoke exhaust is provided in accordance with Section 910.4 or 910.5, curtain boards are only required at the separation between areas protected with early suppression fast response (ESFR) sprinklers and conventional sprinkler systems.

910.2 Where required.

Smoke and heat vents or a mechanical smoke removal system shall be installed as required by Sections 910.2.1 and 910.2.2.

Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an *approved automatic sprinkler system*.
2. Smoke and heat removal shall not be required in areas of buildings equipped with early suppression fast-response (ESFR) sprinklers.
3. Smoke and heat removal shall not be required in areas of buildings equipped with control mode special application sprinklers with a response time index of 50 $(m \cdot s)^{1/2}$ or less that are listed to control a fire in stored commodities with 12 or fewer sprinklers.

910.2.1 Group F-1 or S-1.

Smoke and heat vents installed in accordance with Section 910.3 or a mechanical smoke removal system installed in accordance with Section 910.4 shall be installed in buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645 m^2) of undivided area. In occupied portions of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, where the upper surface of the story is not a roof assembly, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

Exception: Group S-1 aircraft repair hangars.

910.2.2 High-piled combustible storage.

Smoke and heat removal required by Table 3206.2 for buildings and portions thereof containing high-piled combustible storage shall be installed in accordance with Section 910.3 in unsprinklered buildings. In buildings and portions thereof containing high-piled combustible storage equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, a smoke and heat removal system shall be installed in accordance with Section 910.3 or 910.4. In occupied portions of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where the upper surface of the story is not a roof assembly, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

910.3 Smoke and heat vents.

The design and installation of smoke and heat vents shall be in accordance with Sections 910.3.1 through 910.3.3.

910.3.1 Listing and labeling.

Smoke and heat vents shall be *listed* and labeled to indicate compliance with UL 793 or FM 4430.

910.3.2 Smoke and heat vent locations.

Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent *lot lines* and *fire walls* and 10 feet (3048 mm) or more from *fire barriers*. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2, with consideration given to roof pitch, sprinkler location and structural members.

910.3.3 Smoke and heat vents area.

The required aggregate area of smoke and heat vents shall be calculated as follows:

For buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1:

$$A_{VR} = V/9000 \quad \text{(Equation 9-3)}$$

where:

A_{VR} = The required aggregate vent area (ft^2).

V = Volume (ft^3) of the area that requires smoke removal.

For unsprinklered buildings:

$$A_{VR} = A_{FA}/50 \quad \text{(Equation 9-4)}$$

where:

A_{VR} = The required aggregate vent area (ft^2).

A_{FA} = The area of the floor in the area that requires smoke removal.

910.4 Mechanical smoke exhaust.

Mechanical smoke exhaust shall be in accordance with Sections 910.4.1 through 910.4.7.

910.4.1 Automatic sprinklers required.

The building shall be equipped throughout with an approved *automatic sprinkler system* in accordance with Section 903.3.1.1.

910.4.2 Exhaust fan construction.

Exhaust fans that are part of a mechanical smoke removal system shall be rated for operation at 221°F (105°C). Exhaust fan motors shall be located outside of the exhaust fan air stream.

910.4.3 System design criteria.

The mechanical smoke removal system shall be sized to exhaust the building at a minimum rate of two air changes per hour based on the volume of the building or portion thereof without contents. The capacity of each exhaust fan shall not exceed 30,000 cubic feet per minute (14.2 m^3/s).

910.4.3.1 Supply air.

Supply air for exhaust fans shall be sized to provide a minimum of 50 percent of the required exhaust. Air velocity at each supply air opening shall not exceed an average of 200 feet per minute when measured 4 feet (1,219 mm) in front of the opening. Openings for supply air shall be uniformly distributed around the periphery of the area served and be located or ducted to a position not more than one-half the storage height above the floor. Supply air openings shall open automatically upon operation of the smoke exhaust system and shall not require a manual action at each supply opening for operation. Supply air openings shall be kept clear of storage or obstructions to airflow for at least 4 feet (1,219 mm) in front of the opening. Supply air openings shall be separated from exhaust fans and exterior combustibles to prevent introduction of smoke into the building.

910.4.4 Operation.

Mechanical smoke exhaust fans shall be manually activated. Individual manual controls of each fan unit shall also be provided.

910.4.5 Manual control location.

Manual controls shall be located where they are able to be accessed by the fire service from an exterior door of the building and separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

910.4.6 Control wiring.

Wiring for operation and control of mechanical smoke removal systems shall be connected ahead of the main disconnect in accordance with Section 701.12E of NFPA 70 and be protected against interior fire exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than 15 minutes.

910.4.7 Controls.

Where building air-handling and mechanical smoke removal systems are combined or where independent building air-handling systems are provided, fans shall automatically shut down in accordance with the *International*

Mechanical Code. The manual controls provided for the smoke removal system shall have the capability to override the automatic shutdown of fans that are part of the smoke removal system.

910.5 Calculated engineering design of mechanical smoke exhaust.

Calculated engineering design of mechanical smoke exhaust shall be in accordance with Sections 910.5.1 through 910.5.5.

910.5.1 Methodology.

Mechanical smoke exhaust systems shall be designed to remove smoke after a fire is extinguished and to assist the fire department during suppression operations or during marginal sprinkler control situations. They are not considered life safety systems and are not designed for occupant safety.

910.5.2 Calculation method.

Volumetric flow rate calculations shall demonstrate that the system will provide at least three air changes per hour for the space required to be provided with smoke exhaust. When only a portion of a space is used for high-piled storage requiring smoke exhaust, the volume to be extracted shall be based on the ceiling height multiplied by the actual gross floor area for storage.

910.5.3 Operation.

Mechanical smoke exhaust fans shall be manually activated. In addition, individual manual controls of each fan unit shall also be provided.

910.5.4 Supply air.

Supply air for exhaust fans shall be sized to provide a minimum of 50 percent of the required exhaust. Air velocity at each supply air opening shall not exceed an average of 200 feet per minute when measured 4 feet (1,219 mm) in front of the opening. Openings for supply air shall be uniformly distributed around the periphery of the area served and be located or ducted to a position not more than one-half the storage height above the floor. Supply air openings shall open automatically upon operation of the smoke exhaust system and shall not require a manual action at each supply opening for operation. Supply air openings shall be kept clear of storage or obstructions to airflow for at least 4 feet (1,219 mm) in front of the opening. Supply air openings shall be separated from exhaust fans and exterior combustibles to prevent introduction of smoke into the building.

910.5.5 Equipment.

Wiring and controls shall be as required in Sections 910.4.5 and 910.4.6. Interlock controls shall be as required in Section 910.4.7. Exhaust fans shall be uniformly spaced and each fan shall have a maximum individual capacity of 30,000 cfm (850 m^3/min).

910.6 Testing and maintenance.

Mechanical smoke exhaust systems shall be tested and maintained as required in Sections 910.6.1 through 910.6.4.

910.6.1 Acceptance testing.

Mechanical smoke exhaust systems shall be acceptance tested as required by Sections 909.18 and 909.19.

910.6.1.1 Controls.

For testing purposes, each smoke exhaust system equipped for automatic activation shall be put into operation by the actuation of the automatic initiating device. Control sequences shall be verified throughout the system, including verification of override from the firefighter's control panel when systems are equipped for automatic activation.

910.6.2 Special inspections.

Special inspections for mechanical smoke exhaust shall be conducted according to Section 909.18.8.

910.6.3 Maintenance.

Mechanical smoke exhaust systems, including exhaust fans, supply air openings and controls, shall be maintained and unobstructed.

910.6.4 Operational testing.

Operational testing of the smoke exhaust system shall include all equipment such as initiating devices, fans, dampers, controls and supply air openings. Mechanical smoke exhaust systems shall be operated and tested under each control sequence at least annually.

910.7 Maintenance.

Smoke and heat vents shall be maintained in an operative condition in accordance with NFPA 204. Fusible links shall be promptly replaced whenever fused, damaged, or painted. Smoke and heat vents shall not be modified.

SECTION 911
EXPLOSION CONTROL

911.1 General.

Explosion control shall be provided in the following locations:

1. Where a structure, room or space is occupied for purposes involving explosion hazards as identified in Table 911.1.
2. Where quantities of hazardous materials specified in Table 911.1 exceed the maximum allowable quantities in Table 5003.1.1(1).

Such areas shall be provided with explosion (*deflagration*) venting, explosion (*deflagration*) prevention systems or *barricades* in accordance with this section and NFPA 69, or NFPA 495 as applicable. *Deflagration* venting shall not be utilized as a means to protect buildings from *detonation* hazards.

TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS[f]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems**
Hazard Category			
Combustible dusts[a]	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA[b]	Not required	Required
	IB[c]	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2[e]	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist[d]	Detonation	Required	Not permitted
	Deflagration	Not required	Required

a. Combustible dusts that are generated during manufacturing or processing. See definition of "Combustible dust" in Chapter 2.

b. Storage or use.

c. In open use or dispensing.

d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the *International Building Code*.

911.2 Required deflagration venting.

Areas that are required to be provided with *deflagration* venting shall comply with the following:

1. Walls, ceilings and roofs exposing surrounding areas shall be designed to resist a minimum internal pressure of 100 pounds per square foot (psf) (4788 Pa). The minimum internal design pressure shall be not less than five times the maximum internal relief pressure specified in Item 5 of this section.
2. *Deflagration* venting shall be provided only in exterior walls and roofs.

   Exception: Where sufficient *exterior wall* and roof venting cannot be provided because of inadequate exterior wall or roof area, *deflagration* venting shall be allowed by specially designed shafts vented to the exterior of the building.
3. *Deflagration* venting shall be designed to prevent unacceptable structural damage. Where relieving a *deflagration*, vent closures shall not produce projectiles of sufficient velocity and mass to cause life threatening injuries to the occupants or other persons on the property or adjacent *public ways*.
4. The aggregate clear area of vents and venting devices shall be governed by the pressure resistance of the construction assemblies specified in Item 1 of this section and the maximum internal pressure allowed by Item 5 of this section.
5. Vents shall be designed to withstand loads in accordance with the *International Building Code*. Vents shall consist of any one or any combination of the following to relieve at a maximum internal pressure of 20 pounds per square foot (958 Pa), but not less than the loads required by the *International Building Code*:
   5.1. *Exterior walls* designed to release outward.
   5.2. Hatch covers.
   5.3. Outward swinging doors.
   5.4. Roofs designed to uplift.
   5.5. Venting devices *listed* for the purpose.
6. Vents designed to release from the *exterior walls* or roofs of the building when venting a *deflagration* shall discharge directly to the exterior of the building where an unoccupied space not less than 50 feet (15 240 mm) in width is provided between the exterior walls of the building and the lot line.

   Exception: Vents complying with Item 7 of this section.
7. Vents designed to remain attached to the building when venting a *deflagration* shall be so located that the discharge opening shall be not less than 10 feet (3048 mm) vertically from window openings and *exits* in the building and 20 feet (6096 mm) horizontally from *exits* in the building, from window openings and *exits* in adjacent buildings on the same lot and from the lot line.
8. Discharge from vents shall not be into the interior of the building.

911.3 Explosion prevention systems.

Explosion prevention systems shall be of an *approved* type and installed in accordance with the provisions of this code and NFPA 69.

911.4 Barricades.

Barricades shall be designed and installed in accordance with NFPA 495.

SECTION 912
FIRE DEPARTMENT CONNECTIONS

912.1 Installation.

Fire department connections shall be installed in accordance with the NFPA standard applicable to the system design and shall comply with Sections 912.2 through 912.7.

912.2 Location.

With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be *approved* by the *fire code official*.

912.2.1 Visible location.

Fire department connections shall be located on the street side of buildings or facing *approved* fire apparatus access roads, fully visible and recognizable from the street, fire apparatus access road or nearest point of fire department vehicle access or as otherwise *approved* by the *fire code official*.

912.2.2 Existing buildings.

On existing buildings, wherever the fire department connection is not visible to approaching fire apparatus, the fire department connection shall be indicated by an *approved* sign mounted on the street front or on the side of the building. Such sign shall have the letters "FDC" not less than 6 inches (152 mm) high and words in letters not less than 2 inches (51 mm) high or an arrow to indicate the location. Such signs shall be subject to the approval of the *fire code official*.

912.2.3 Connection height.

Newly installed fire department connections shall be located not less than 18 inches (457 mm) and not more than 4 feet (1.2 m) above the level of the adjacent grade or access level.

912.3 Fire hose threads.

Fire hose threads used in connection with standpipe systems shall be *approved* and shall be compatible with fire department hose threads.

912.4 Access.

Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other fixed or moveable object. Access to fire department connections shall be *approved* by the *fire code official*.

Exception: Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.5 and a means of emergency operation. The gate and the means of emergency operation shall be *approved* by the *fire code official* and maintained operational at all times.

912.4.1 Locking fire department connection caps.

The *fire code official* is authorized to require locking caps on fire department connections for water-based *fire protection systems* where the responding fire department carries appropriate key wrenches for removal.

912.4.2 Clear space around connections.

A working space of not less than 36 inches (914 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or *approved* by the *fire code official*.

912.4.3 Physical protection.

Where fire department connections are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312.

912.5 Signs.

A metal sign with raised letters not less than 1 inch (25 mm) in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

912.6 Backflow protection.

The potable water supply to automatic sprinkler and standpipe systems shall be protected against backflow as required by the *International Plumbing Code*.

912.7 Inspection, testing and maintenance.

Fire department connections shall be periodically inspected, tested and maintained in accordance with NFPA 25. Records of inspection, testing and maintenance shall be maintained.

SECTION 913
FIRE PUMPS

913.1 General.

Where provided, fire pumps shall be installed in accordance with this section and NFPA 20.

913.2 Protection against interruption of service.

The fire pump, driver and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

913.2.1 Protection of fire pump rooms.

Rooms where fire pumps are located shall be separated from all other areas of the building in accordance with Section 913.2.1 of the *International Building Code*.

913.2.2 Circuits supplying fire pumps.

Cables used for survivability of circuits supplying fire pumps shall be protected using one of the following methods:

1. Cables used for survivability of required critical circuits shall be *listed* in accordance with UL 2196 and shall have a *fire-resistance rating* of not less than 1 hour.
2. Electrical circuit protective systems shall have a *fire-resistance rating* of not less than 1 hour. Electrical circuit protective systems shall be installed in accordance with their listing requirements.
3. Construction having a *fire-resistance rating* of not less than 1 hour.

913.3 Temperature of pump room.

Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

913.3.1 Engine manufacturer's recommendation.

Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

913.4 Valve supervision.

Where provided, the fire pump suction, discharge and bypass valves, and isolation valves on the backflow prevention device or assembly shall be supervised open by one of the following methods:

1. Central-station, proprietary or remote-station signaling service.
2. Local signaling service that will cause the sounding of an audible signal at a constantly attended location.
3. Locking valves open.
4. Sealing of valves and *approved* weekly recorded inspection where valves are located within fenced enclosures under the control of the *owner*.

913.4.1 Test outlet valve supervision.

Fire pump test outlet valves shall be supervised in the closed position.

913.5 Testing and maintenance.

Fire pumps shall be inspected, tested and maintained in accordance with the requirements of this section and NFPA 25. Records of inspection, testing and maintenance shall be maintained.

913.5.1 Acceptance test.

Acceptance testing shall be done in accordance with the requirements of NFPA 20.

913.5.2 Generator sets.

Engine generator sets supplying emergency or standby power to fire pump assemblies shall be periodically tested in accordance with NFPA 110. Records of testing shall be maintained.

913.5.3 Transfer switches.

Automatic transfer switches shall be periodically tested in accordance with NFPA 110. Records of testing shall be maintained.

913.5.4 Pump room environmental conditions.

Tests of pump room environmental conditions, including heating, ventilation and illumination, shall be made to ensure proper manual or automatic operation of the associated equipment.

SECTION 914
FIRE PROTECTION BASED ON SPECIAL DETAILED REQUIREMENTS OF USE AND OCCUPANCY

914.1 General.

This section shall specify where *fire protection systems* are required based on the detailed requirements of use and occupancy of the *International Building Code*.

914.2 Covered and open mall buildings.

Covered and open mall buildings shall comply with Sections 914.2.1 through 914.2.4.

914.2.1 Automatic sprinkler system.

Covered and open mall buildings and buildings connected shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, which shall comply with the all of the following:

1. The automatic sprinkler system shall be complete and operative throughout occupied space in the mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with approved alternative protection.
2. Sprinkler protection for the mall of a covered mall building shall be independent from that provided for tenant spaces or anchor buildings.
3. Sprinkler protection for the tenant spaces of an open mall building shall be independent from that provided for anchor buildings.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an open mall.
5. Where tenant spaces are supplied by the same system, they shall be independently controlled.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of open parking garages separated from the covered or open mall in accordance with Section 402.4.2.3 of the *International Building Code* and constructed in accordance with Section 406.5 of the *International Building Code*.

914.2.2 Standpipe system.

The covered and open mall building shall be equipped throughout with a standpipe system as required by Section 905.3.3.

914.2.3 Emergency voice/alarm communication system.

Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. *Access to emergency voice/alarm communication systems serving a mall, required or otherwise, shall be provided for* the fire department. The system shall be provided in accordance with Section 907.5.2.2.

914.2.4 Fire department access to equipment.

Rooms or areas containing controls for air-conditioning systems, automatic fire-extinguishing systems, *automatic sprinkler systems* or other detection, suppression or control elements shall be identified for use by the fire department.

914.3 High-rise buildings.

High-rise buildings shall comply with Sections 914.3.1 through 914.3.7.

914.3.1 Automatic sprinkler system.

Buildings and structures shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of:

1. Open parking garages in accordance with Section 406.5 of the *International Building Code*.
2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

914.3.1.1 Number of sprinkler risers and system design.

Each sprinkler system zone in buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.

914.3.1.1.1 Riser location.

Sprinkler risers shall be placed in interior exit stairways and ramps that are remotely located in accordance with Section 1007.

914.3.1.2 Water supply to required fire pumps.

In buildings that are more than 420 feet (128 m) in *building height*, required fire pumps shall be supplied by connections to not fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections.

914.3.2 Secondary water supply.

An automatic secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings assigned to Seismic Design Category C, D, E or F as determined by the *International Building Code*. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

914.3.3 Fire alarm system.

A fire alarm system shall be provided in accordance with Section 907.2.12.

914.3.4 Automatic smoke detection.

Smoke detection shall be provided in accordance with Section 907.2.12.1.

914.3.5 Emergency voice/alarm communication system.

An emergency voice/alarm communication system shall be provided in accordance with Section 907.5.2.2.

914.3.6 Emergency responder radio coverage.

Emergency responder radio coverage shall be provided in accordance with Section 510.

914.3.7 Fire command.

A *fire command center* complying with Section 508 shall be provided in a location *approved* by the fire department.

914.4 Atriums.

Atriums shall comply with Sections 914.4.1 and 914.4.2.

914.4.1 Automatic sprinkler system.

An *approved automatic sprinkler system* shall be installed throughout the entire building.

Exceptions:

1. That area of a building adjacent to or above the atrium need not be sprinklered, provided that portion of the building is separated from the atrium portion by not less than a 2-hour *fire barrier* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.
2. Where the ceiling of the atrium is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.

914.4.2 Fire alarm system.

A fire alarm system shall be provided where required by Section 907.2.13.

914.5 Underground buildings.

Underground buildings shall comply with Sections 914.5.1 through 914.5.5.

914.5.1 Automatic sprinkler system.

The highest *level of exit discharge* serving the underground portions of the building and all levels below shall be equipped with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1. Water-flow switches and control valves shall be supervised in accordance with Section 903.4.

914.5.2 Smoke control system.

A smoke control system is required to control the migration of products of combustion in accordance with Section

909 and provisions of this section. Smoke control shall restrict movement of smoke to the general area of fire origin and maintain *means of egress* in a usable condition.

914.5.3 Compartment smoke control system.

Where compartmentation is required by Section 405.4 of the *International Building Code*, each compartment shall have an independent smoke control system. The system shall be automatically activated and capable of manual operation in accordance with Section 907.2.17.

914.5.4 Fire alarm system.

A fire alarm system shall be provided where required by Sections 907.2.17 and 907.2.18.

914.5.5 Standpipe system.

The underground building shall be provided throughout with a standpipe system in accordance with Section 905.

914.6 Stages.

Stages shall comply with Sections 914.6.1 and 914.6.2.

914.6.1 Automatic sprinkler system.

Stages shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X gypsum board not less than $^5/_8$ inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

914.6.2 Standpipe system.

Standpipe systems shall be provided in accordance with Section 905.

914.7 Special amusement buildings.

Special amusement buildings shall comply with Sections 914.7.1 and 914.7.2.

914.7.1 Automatic sprinkler system.

Special amusement buildings shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Where the special amusement building is temporary, the sprinkler water supply shall be of an *approved* temporary means.

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement building is less than 1,000 square feet (93 m^2) and the *exit access* travel distance from any point to an *exit* is less than 50 feet (15 240 mm).

914.7.2 Automatic smoke detection.

Special amusement buildings shall be equipped with an automatic smoke detection system in accordance with Section 907.2.11.

914.8 Aircraft-related occupancies.

Aircraft-related occupancies shall comply with Sections 914.8.1 through 914.8.6.

914.8.1 Automatic smoke detection systems.

Airport traffic control towers shall be provided with an automatic smoke detection system installed in accordance with Section 907.2.21.

914.8.2 Automatic sprinkler system for new airport traffic control towers.

Where an occupied floor is located more than 35 feet (10 668 mm) above the lowest level of fire department vehicle access, new airport traffic control towers shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

914.8.3 Fire suppression for aircraft hangars.

Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based on the classification for the hangar given in Table 914.8.3.

Exception: Where a fixed base operator has separate repair facilities on site, Group II hangars 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.

TABLE 914.8.3
HANGAR FIRE SUPPRESSION REQUIREMENTS[a, b, c]

MAXIMUM SINGLE FIRE AREA (square feet)	INTERNATIONAL BUILDING CODE TYPE OF CONSTRUCTION								
	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
> 40,001	Group I	Group I	Group I	Group I	Group I	Group I	Group I	Group I	Group I
40,000	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II
30,000	Group III	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II
20,000	Group III	Group III	Group II	Group II	Group II	Group II	Group II	Group II	Group II
15,000	Group III	Group III	Group III	Group II	Group III	Group II	Group III	Group II	Group II
12,000	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group II	Group II
8,000	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group II
5,000	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III

For SI: 1 square foot = 0.0929 m^2, 1 foot = 304.8 mm.

a. Aircraft hangars with a door height greater than 28 feet shall be provided with fire suppression for a Group I hangar regardless of maximum fire area.

b. Groups shall be as classified in accordance with NFPA 409.

c. Membrane structures complying with Section 3102 of the *International Building Code* shall be classified as a Group IV hangar.

914.8.3.1 Hazardous operations.

Any Group III aircraft hangar in accordance with Table 914.8.3 that contains hazardous operations including, but not limited to, the following shall be provided with a Group I or II fire suppression system in accordance with NFPA 409 as applicable:

1. Doping.
2. Hot work including, but not limited to, welding, torch cutting and torch soldering.
3. Fuel transfer.
4. Fuel tank repair or maintenance not including defueled tanks in accordance with NFPA 409, inerted tanks or tanks that have never been fueled.
5. Spray finishing operations.
6. Total fuel capacity of all aircraft within the unsprinklered single *fire area* in excess of 1,600 gallons (6057 L).
7. Total fuel capacity of all aircraft within the maximum single *fire area* in excess of 7,500 gallons (28 390 L) for a hangar equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

914.8.3.2 Separation of maximum single fire areas.

Maximum single *fire areas* established in accordance with hangar classification and construction type in Table 914.8.3 shall be separated by 2-hour *fire walls* constructed in accordance with Section 706 of the *International Building Code*. In determining the maximum single fire area as set forth in Table 914.8.3, ancillary uses that are separated from aircraft servicing areas by not less than a 1-hour *fire barrier* constructed in accordance with Section 707 of the *International Building Code* shall not be included in the area.

914.8.4 Finishing.

The process of "doping," involving the use of a volatile flammable solvent, or of painting shall be carried on in a separate detached building equipped with automatic fire-extinguishing equipment in accordance with Section 903.

914.8.5 Residential aircraft hangar smoke alarms.

Smoke alarms shall be provided within residential aircraft hangars in accordance with Section 907.2.20.

914.8.6 Aircraft paint hangar fire suppression.

Aircraft paint hangars shall be provided with fire suppression as required by NFPA 409.

914.9 Application of flammable finishes.

An *automatic sprinkler system* or fire-extinguishing system shall be provided in all spray rooms and spray booths, and

shall be installed in accordance with Chapter 9.

914.10 Drying rooms.

Drying rooms designed for high-hazard materials and processes, including special occupancies as provided for in Chapter 4 of the *International Building Code*, shall be protected by an *approved* automatic fire-extinguishing system complying with the provisions of Chapter 9.

914.11 Ambulatory care facilities.

Occupancies classified as ambulatory care facilities shall comply with Sections 914.11.1 through 914.11.3.

914.11.1 Automatic sprinkler systems.

An *automatic sprinkler system* shall be provided for ambulatory care facilities in accordance with Section 903.2.2.

914.11.2 Manual fire alarm systems.

A manual fire alarm system shall be provided for ambulatory care facilities in accordance with Section 907.2.2.

914.11.3 Fire alarm systems.

An automatic smoke detection system shall be provided for ambulatory care facilities in accordance with Section 907.2.2.1.

SECTION 915
CARBON MONOXIDE DETECTION

915.1 General.

Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1 through 915.6. Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9.

See Minnesota Statutes, section 299F.51, subdivision 5 for information regarding the potential for an owner of a multifamily apartment building to certify that the building has no foreseeable carbon monoxide risk. For an apartment building owner to be eligible to complete the Owner's Certification of Exemption form and submit it to the commissioner of public safety, the building must be all electric with no fuel-fired appliances. Additional information is available on the SFMD website.

915.1.1 Where required.

Carbon monoxide detection shall be provided in Group I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

Exception: In multifamily dwellings, approved and operational carbon monoxide alarms may be installed between 15 and 25 feet of carbon monoxide-producing central fixtures and equipment provided there is a centralized alarm system or other approved mechanism for responsible parties to hear the alarms at all times.

915.1.2 Fuel-burning appliances and fuel-burning fireplaces.

Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

915.1.3 Fuel-burning forced-air furnaces.

Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms served by a fuel-burning, forced-air furnace.

Exception: Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.

915.1.4 Fuel-burning appliances outside of dwelling units, sleeping units and classrooms.

Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms located in buildings that contain fuel-burning appliances or fuel-burning fireplaces.

Exceptions:

1. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms without communicating openings between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide detector is provided in one of the following locations:
   2.1. In an approved location between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.
   2.2. On the ceiling of the room containing the fuel-burning appliance or fuel-burning fireplace.

915.1.5 Private garages.

Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms in buildings with attached private garages.

Exceptions:

1. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms without communicating openings between the private garage and the *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms located more than one story above or below a private garage.
3. Carbon monoxide detection shall not be required where the private garage connects to the building through an open-ended corridor.
4. Where a carbon monoxide detector is provided in an approved location between openings to a private garage and *dwelling units*, *sleeping units* or classrooms.

915.1.6 Exempt garages.

For determining compliance with Section 915.1.5, an open parking garage complying with Section 406.5 of the *International Building Code* or an enclosed parking garage complying with Section 406.6 of the *International Building Code* shall not be considered a private garage.

915.2 Locations.

Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.3.

915.2.1 Dwelling units.

Carbon monoxide detection shall be installed in dwelling units outside of each separate sleeping area within 10 feet of the bedrooms. Where a fuel-burning appliance is located in a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

915.2.2 Sleeping units.

Carbon monoxide detection shall be installed in sleeping units.

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area within 10 feet of the sleeping unit where the sleeping unit or its attached bedroom does not contain a fuel-burning appliance and is not served by a forced air furnace.

915.2.3 Group E occupancies.

Carbon monoxide detectors shall be installed in classrooms in Group E occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception: Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an occupant load of 30 or less.

915.3 Carbon monoxide detection.

Carbon monoxide detection required by Sections 915.1 through 915.2.3 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

915.4 Carbon monoxide alarms.

Carbon monoxide alarms shall comply with Sections 915.4.1 through 915.4.4.

915.4.1 Power source.

Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception: Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.

915.4.2 Listings.

Carbon monoxide alarms shall be listed in accordance with UL 2034.

915.4.3 Locations.

Carbon monoxide alarms shall only be installed in *dwelling units* and in *sleeping units*. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.

915.4.4 Combination alarms.

Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be listed in accordance with UL 2034 and UL 217.

915.5 Carbon monoxide detection systems.

Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

915.5.1 General.

Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be listed in accordance with UL 2075.

915.5.2 Locations.

Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

915.5.3 Combination detectors.

Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided that they are listed in accordance with UL 2075 and UL 268.

915.6 Maintenance.

Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 720. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

915.6.1 Enclosed parking garages.

Carbon monoxide and nitrogen dioxide detectors installed in enclosed parking garages in accordance with the *International Mechanical Code*, Section 404.1 shall be maintained in accordance with the manufacturer's instructions and their listing. Detectors that become inoperable or begin producing end-of-life signals shall be replaced.

Relocated

SECTION 916
GAS DETECTION SYSTEMS

916.1 Gas detection systems.

Gas detection systems required by this code shall comply with Sections 916.2 through 916.11.

916.2 Permits.

Permits shall be required as set forth in Section 105.7.11.

916.2.1 Construction documents.

Documentation of the gas detection system design and equipment to be used that demonstrates compliance with the requirements of this code shall be provided with the application for permit.

916.3 Equipment.

Gas detection system equipment shall be designed for use with the gases being detected and shall be installed in accordance with manufacturer's instructions.

916.4 Power connections.

Gas detection systems shall be permanently connected to the building electrical power supply or shall be permitted to be cord connected to an unswitched receptacle using an *approved* restraining means that secures the plug to the receptacle.

916.5 Emergency and standby power.

Standby or emergency power shall be provided or the gas detection system shall initiate a trouble signal at an *approved* location if the power supply is interrupted.

916.6 Sensor locations.

Sensors shall be installed in approved locations where leaking gases are expected to accumulate.

916.7 Gas sampling.

Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:

1. For HPM gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
2. For toxic gases that are not HPM, sample analysis shall be performed at intervals not exceeding 5 minutes, in accordance with Section 6004.2.2.7.
3. Where a less frequent or delayed sampling interval is *approved*.

916.8 System activation.

A gas detection alarm shall be initiated where any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammability limit (LFL).
2. For nonflammable gases, a gas concentration exceeding one-half of the IDLH, unless a different threshold is specified by the section of this code requiring a gas detection system.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall be distinct from fire alarm and carbon monoxide alarm signals.

916.9 Signage.

Signs shall be provided adjacent to gas detection system alarm signaling devices that advise occupants of the nature of the signals and actions to take in response to the signal.

916.10 Fire alarm system connections.

Gas sensors and gas detection systems shall not be connected to fire alarm systems unless *approved* and connected in accordance with the fire alarm equipment manufacturer's instructions.

916.11 Inspection, testing and sensor calibration.

Inspection and testing of gas detection systems shall be conducted not less than annually. Sensor calibration shall be confirmed at the time of sensor installation and calibration shall be performed at the frequency specified by the sensor manufacturer.

SECTION 917
MASS NOTIFICATION SYSTEMS

917.1 College and university campuses.

Prior to construction of a new building requiring a fire alarm system on a multiple-building college or university campus having a cumulative building occupant load of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an *approved* mass notification system shall be provided in accordance with the findings of the risk analysis.

299F.011 STATE FIRE CODE; ADMINISTRATION AND ENFORCEMENT.

Subdivision 1. MS 2006 [Renumbered 326B.02, subd 6]

Subd. 2. [Repealed, 1981 c 106 s 16]

Subd. 3. **Rules for code administration and enforcement.** The commissioner of public safety shall adopt rules as may be necessary to administer and enforce the code, specifically including but not limited to rules for inspection of buildings and other structures covered by the code and conforming the code to the governmental organization of Minnesota state agencies, political subdivisions and local governments.

Subd. 4. **Applicability; local authority.** The State Fire Code shall be applicable throughout the state and in all political subdivisions and municipalities therein. However, nothing in this subdivision shall prohibit a local unit of government otherwise authorized by law from adopting or enforcing any ordinance or regulation which specifies requirements equal to, in addition to, or more stringent than the requirements of the State Fire Code. Any ordinance or regulation adopted by a local unit which differs from the State Fire Code must be directly related to the safeguarding of life and property from the hazards of fire, must be uniform for each class or kind of building covered, and may not exceed the applicable requirements of the State Building Code adopted pursuant to sections 326B.101 to 326B.151.

Subd. 4a. **Day care home regulation.**

(a) Notwithstanding any contrary provision of this section, the fire marshal shall not adopt or enforce a rule:

(1) establishing staff ratios, age distribution requirements, and limitations on the number of children in care;

(2) regulating the means of egress from family or group family day care homes in addition to the egress rules that apply to the home as a single family dwelling; or

(3) confining family or group family day care home activities to the floor of exit discharge.

(b) For purposes of this subdivision, “family or group family day care home” means a dwelling unit in which the day care provider provides the services referred to in Section 245A.02, subdivision 10, to one or more persons.

(c) Nothing in this subdivision prohibits the Department of Human Services from adopting or enforcing rules regulating day care, including the subjects in paragraph (a), clauses (1) and (3). The department may not, however, adopt or enforce a rule stricter than paragraph (a), clause (2).

(d) The Department of Human Services may by rule adopt procedures for requesting the state fire marshal or a local fire marshal to conduct an inspection of day care homes to ensure compliance with state or local fire codes.

(e) The commissioners of public safety and human services may enter into an agreement for the commissioner of human services to perform follow-up inspections of programs, subject to licensure under chapter 245A, to determine whether certain violations cited by the state fire marshal have been corrected. The agreement shall identify specific items the commissioner of human services is permitted to inspect. The list of items is not subject to rulemaking and may be changed by mutual agreement between the state fire marshal and the commissioner. The agreement shall provide for training of individuals who will conduct follow-up inspections. The agreement shall contain procedures for the commissioner of human services to follow when the commissioner requires assistance from the state fire marshal to carry out the duties of the agreement.

(f) No tort liability is transferred to the commissioner of human services as a result of the commissioner of human services performing activities within the limits of the agreement.

Subd. 4b. **Stairway.** The State Fire Code shall not require stairways of existing multiple dwelling buildings of two stories or less to be enclosed. For the purposes of this subdivision the term “stories” has the meaning given it in the State Building Code.

Subd. 4c. [Repealed, 2005 c 136 art 9 s 15]

Subd. 5. **Appeal policy; variance.** Upon application, the state fire marshal may grant variances from the minimum requirements specified in the code if there is substantial compliance with the provisions of the code, the safety of the public and occupants of such building will not be jeopardized, and undue hardship will result to the applicant unless such variance is granted. No appeal to the state fire marshal for a variance from orders issued by a local fire official from the State Fire Code shall be accepted until the applicant has first made application to the local governing body and the local unit has acted on the application. The state fire marshal shall consider any decisions or recommendations of the local governing body. Any person aggrieved by a decision made by the fire marshal under this subdivision may proceed before the fire marshal as with a contested case in accordance with the Administrative Procedure Act.

Subd. 5a. **Local board of appeal.** Local governing bodies may appoint boards of appeal to hear and rule on appeals from orders issued under the fire code. An appeal from a local board of appeal may be made to the local governing body.

If a board of appeal is not appointed, the appeals of orders must be made directly to the governing body. Local boards of appeal and governing bodies are not liable for damages in connection with granting variances, abatements, denials, or modifications of orders from the fire code that are made in good faith.

Subd. 5b. **Variance considerations.** When considering appeals for variances from the fire code, the local appeal board or governing body, the state fire marshal, a state administrative law judge, and a court shall take into consideration the benefit to be obtained by complying with the fire marshal's orders and the effect on affordable housing, provided that the spirit of the code is complied with and public safety secured.

Subd. 6. **Misdemeanor.** A person who violates a provision of the State Fire Code shall be guilty of a misdemeanor. No person shall be convicted for violating the State Fire Code unless the person shall have been given notice of the violation in writing and reasonable time to comply. The notice must contain a statement explaining the right to appeal the orders.

Subd. 7. **Fees.** The state fire marshal shall charge a fee of $100 for each plan review involving:

(1) flammable liquids;
(2) motor vehicle fuel-dispensing stations; or
(3) liquefied petroleum gases.

History: *1974 c 550 s 1; 1978 c 777 s 1; 1981 c 106 s 1; 1982 c 424 s 114,130; 1984 c 544 s 89; 1984c 654 art 5 s 58; 1984 c 658 s 3; 1985 c 248 s 70; 1986 c 444; 1Sp1986 c 3 art 4 s 10; 1987 c 201 s 1-3;1987 c 333 s 22; 1990 c 388 s 1; 1991 c 149 s 3; 1991 c 235 art 3 s 2; 1992 c 513 art 9 s 33; 1992 c 597s 16; 1993 c 327 s 16; 2002 c 220 art 7 s 13; 2005 c 136 art 9 s 4,14; 2006 c 260 art 3 s 19; 2007 c 140art 2 s 1; art 3 s 6; art 4 s 61; art 13 s 4; 2008 c 337 s 4*

CHAPTER 7512

DEPARTMENT OF PUBLIC SAFETY

FIRE PROTECTION SYSTEMS, PERSONNEL

7512.0100 DEFINITIONS.
7512.0200 PURPOSE.
7512.0300 SCOPE; EFFECTIVE DATE.

FIRE PROTECTION CONTRACTOR

7512.0400 CONTRACTOR LICENSE REQUIRED; EXCEPTIONS.
7512.0500 INITIAL APPLICATION FOR CONTRACTOR LICENSE.
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MANAGING EMPLOYEE

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JOURNEYMAN SPRINKLER FITTER

7512.1700 JOURNEYMAN SPRINKLER FITTER EXAMINATION.
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APPRENTICE SPRINKLER FITTER

7512.2100 APPRENTICE SPRINKLER FITTER REGISTRATION.
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EXAMINATIONS

7512.2400 EXAMINATIONS.

REVOCATION AND SUSPENSION

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7512.2600 REVOCATION.

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7512.2750 CIVIL PENALTY.

7512.2770 CEASE AND DESIST ORDER.

MUNICIPAL PERMIT PROGRAMS

7512.2800 MUNICIPAL PERMIT PROGRAM.

7512.0100 DEFINITIONS.

Subpart 1. **Scope.** The terms used in parts 7512.0100 to 7512.2800 have the meanings given them in this part and in Minnesota Statutes, section 299M.01.

Subp. 2. **Authority having jurisdiction.** "Authority having jurisdiction" means the governmental organization, office, or individual responsible for approving equipment and installation or a procedure.

Subp. 3. **Board member.** "Board member" means a director in a corporation and a governor in a limited liability company.

Subp. 4. **Building code.** "Building code" means the Minnesota State Building Code adopted pursuant to Minnesota Statutes, section 326B.106, subdivision 1, and includes future amendments to the building code.

Subp. 5. **Commissioner.** "Commissioner" means the commissioner of public safety, acting directly or through the state fire marshal and other authorized agents.

Subp. 6. **Days.** "Days" means calendar days when referring to the amount of time when the performance or doing of any act, duty, matter, payment, or thing is ordered, directed, or prescribed. A period of time measured in days, except as otherwise provided, must be computed so as to exclude the first and include the last day of the prescribed or fixed period or duration of time. When the last day of the period falls on a Saturday, Sunday, or legal holiday, that day must be omitted from the computation.

Subp. 7. **Federal approval agency.** "Federal approval agency" means the United States Department of Labor, Bureau of Apprenticeship and Training.

Subp. 8. **Fire code.** "Fire code" means the Minnesota Uniform Fire Code adopted pursuant to Minnesota Statutes, section 326B.02, subdivision 6, and includes future amendments to the fire code.

Subp. 9. **Fire protection-related work.** "Fire protection-related work," when applied to a licensed fire protection contractor, means the sale, design, installation, modification, or inspection of a fire protection system, its parts, or related equipment, or the offer to do so. Fire protection-related work, when applied to a journeyman sprinkler fitter or an apprentice sprinkler fitter, means the installation, connection, alteration, repair, or addition to a fire protection system.

Subp. 10. **Inspect or inspection.** "Inspect" or "inspection" means conducting a final acceptance test; trip test of dry pipe, deluge, or preaction valves; or a test that an authority having jurisdiction requires to be conducted under the supervision of a contractor.

Subp. 11. **Officer.** "Officer" means an officer of a corporation and a manager of a limited liability company.

Subp. 12. **Owner.** "Owner" means the sole proprietor of a sole proprietorship, a partner in a partnership, a shareholder holding an interest of five percent or more in a corporation, and a member holding an interest of five percent or more in a limited liability company.

Subp. 13. **Potable water source.** "Potable water source" means a gravity tank, fire pump, reservoir or pressure tank, well, city main, or any combination of these that provides a reliable, constant, and sufficient supply of water capable of being used for human consumption.

Subp. 14. **State approval agency.** "State approval agency" means the Department of Labor and Industry or a state agency in Minnesota or another state if the commissioner determines that the state agency approves training programs and monitors apprentice or trainee progress in a manner comparable to that done by the Department of Labor and Industry or by the United States Department of Labor, Bureau of Apprenticeship and Training.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2007 c 140 art 3 s 6; art 4 s 61; art 13 s 4*
Published Electronically: *February 10, 2009*

7512.0200 PURPOSE.

The purpose of parts 7512.0100 to 7512.2800 is to provide fire protection (sprinkler and standpipe) system rules relating to persons who sell, design, inspect, install, modify, alter, add to, repair, or connect the systems to ensure readiness intended for protecting life and property from fire and relating to the administration and enforcement of Minnesota Statutes, chapter 299M.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*
Published Electronically: *November 8, 2006*

7512.0300 SCOPE; EFFECTIVE DATE.

Parts 7512.0100 to 7512.2800 are intended to be consistent with Minnesota Statutes, chapter 299M. Parts 7512.0100 to 7512.2800 govern regulation by municipalities; permit, filing, inspection, certificate, and license fees; qualifications, examination, and licensing of fire protection contractors; certification of journeyman sprinkler fitters; registration of apprentices; and the administration and enforcement of parts 7512.0100 to 7512.2800 and Minnesota Statutes, chapter 299M.

The effective date of parts 7512.0100 to 7512.2800 is February 21, 1994. A person who submits satisfactory proof to the commissioner of actively engaging in full-time fire protection system installation as a fire protection contractor for a period of five years before February 21, 1994, and

who applies for a license on or before April 21, 1994, is eligible for licensure without examination until February 21, 1996. A person who submits satisfactory proof to the commissioner of actively engaging in full-time fire protection systems installation as a sprinkler fitter for a period of five years before February 21, 1994, and who applies for a certificate on or before February 21, 1994, is eligible for certification without examination until February 14, 1996. A person who is exempt from examination for the two-year period, fulfills all other requirements under this chapter and under Minnesota Statutes, chapter 299M, and pays the required annual fee must be granted the appropriate license or certificate. A person who is exempt from examination by this part must pass the examination by February 21, 1996, or surrender the license or certificate. A license or certificate obtained without examination is not renewable on or after February 21, 1996, until the appropriate examination is passed.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

FIRE PROTECTION CONTRACTOR

7512.0400 CONTRACTOR LICENSE REQUIRED; EXCEPTIONS.

Subpart 1. **License required.** Except as provided in subpart 2, a person must have a fire protection contractor license to perform fire protection-related work.

Subp. 2. **Exceptions.** A person does not need a fire protection contractor license for the following activities:

A. A person does not need a contractor license to sell fire protection system parts or related equipment to a licensed contractor.

B. A person does not need a contractor license to install or service a special agent fire suppression system that is not connected to a potable water source. A special agent fire suppression system uses extinguishing agents other than water and includes such systems as dry chemical systems, carbon dioxide systems, halogenated and gaseous agent systems, foam systems, and wet chemical systems.

C. A person does not need a contractor license when acting in an official capacity as a building official, fire official, or insurance inspector.

D. A person licensed as a plumber under Minnesota Statutes, section 326B.46, does not need a contractor license to sell, design, install, modify, or inspect a standpipe or hose system only.

E. A person licensed as a professional engineer under Minnesota Statutes, section 326.03, who is competent in fire protection system design does not need a contractor license to perform activities authorized by the professional engineer license.

F. A person licensed as an alarm and communication contractor under Minnesota Statutes, section 326B.34, or a Minnesota-licensed electrical contractor under Minnesota Statutes, section

326B.33, does not need a fire protection contractor license to perform activities authorized by the alarm and communication contractor license or electrical contractor license.

G. A person does not need a contractor license to maintain a fire protection system. For purposes of this item, "maintain" means the scheduled activities to keep a fire protection system operable. Maintain also means to make emergency repairs to correct an emergency impairment of a fire protection system, until such time as permanent repairs can be done by a licensed fire protection contractor.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2007 c 140 art 5 s 32; art 6 s 15; art 13 s 4*

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7512.0500 INITIAL APPLICATION FOR CONTRACTOR LICENSE.

Subpart 1. **Contents of application.** An initial application for a fire protection contractor license must be on a form provided or approved by the commissioner and must meet the following requirements:

A. The application must contain the name, address, and telephone number of the applicant. The application must also contain each additional name and address that the applicant will use to conduct business transactions.

B. The application must indicate whether the applicant is an individual, partnership, corporation, or limited liability company. The application must also list each owner, officer, and board member.

C. The application must give the name of the managing employee for the contractor.

D. The application must contain the full name, date of birth, and driver's license number of each person named on the application. If a person does not have a driver's license, the application must contain the identification card number of that person. If a person's driver's license or identification card was issued by another state or country, the application must list the name of the state or country.

E. The application must contain a history of fire protection contractor licensure of each person, partnership, corporation, and limited liability company named on the application. The history must be of each license applied for or issued by Minnesota or by another jurisdiction and must include the issuance and expiration dates of the license. If the jurisdiction refused to issue, revoked, or suspended a license, the history must give the date and the reason.

F. The application must give the name of the provider and the policy number of the applicant's insurance required under part 7512.1000. The application must be accompanied by documentation showing that the insurance meets the requirements of part 7512.1000. The documentation must be in the form of a certificate of insurance executed by an insurer authorized to do business in Minnesota and countersigned by an insurance agent licensed in Minnesota.

G. The application must be accompanied by a bond meeting the requirements of part 7512.1000.

H. The application must be accompanied by a completed tax information form required by the commissioner of revenue under Minnesota Statutes, section 270C.72.

I. The application must be accompanied by documentation showing compliance with the workers' compensation insurance coverage requirement of Minnesota Statutes, section 176.181, subdivision 2. The documentation must contain the name of the insurance company, the policy number, and dates of coverage, or the permit to self-insure.

J. The application must be accompanied by a license fee of $575.

K. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements for a contractor of parts 7512.0100 to 7512.2800 and Minnesota Statutes, chapter 299M.

L. Each person named on the application shall sign the application, verifying that the information in the application is true.

Subp. 2. **Issuing license.** Except as provided in subpart 3, the commissioner shall use the provisions of this subpart to determine whether to issue a fire protection contractor license. The commissioner shall issue a fire protection contractor license to the applicant, unless there is a reason to refuse to issue. The commissioner shall refuse to issue a license for any of the following reasons:

A. The application or the items filed with the application do not meet the requirements of subpart 1.

B. The person designated on the application as managing employee does not meet the requirements of a managing employee set out in parts 7512.1300 to 7512.1600.

C. The applicant is currently under revocation or suspension as a contractor or managing employee.

D. A person named on the application was an owner, officer, board member, or managing employee of a fire protection contractor whose license was revoked under part 7512.2600. After the revocation period has elapsed, an applicant is not disqualified.

E. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

F. The applicant does not meet the requirements for a contractor set out in parts 7512.0400 to 7512.1200 and Minnesota Statutes, chapter 299M.

Subp. 3. **Designer contractor license.** The commissioner shall issue a designer contractor license to an applicant who performs fire protection-related work that is limited to the design of fire protection systems. To obtain a designer contractor license, the applicant shall submit to the commissioner a license application that meets the requirements of subpart 1, except that the bond amount must be $10,000 and the license fee must be $150. The annual license renewal fee is $75.

The person designated on the application as managing employee must meet the requirements of a managing employee set out in parts 7512.1300 to 7512.1600, except that to qualify for examination, the person must hold a Level IV certification by the National Institute for Certification in Engineering Technologies, in the field of fire protection, and in the subfield of automatic sprinkler system layout. When performing fire protection-related work, the designer contractor is limited to designing fire protection systems.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*

Published Electronically: *November 8, 2006*

7512.0600 CONTRACTOR LICENSE RENEWAL.

Subpart 1. **License expiration date.** A fire protection contractor license expires at midnight on June 30 of each year. A license is valid upon renewal until the following June 30.

Subp. 2. **Renewal application.** A renewal application for a contractor license must be on a form provided or approved by the commissioner and must contain the following information and items:

A. The application must contain the contractor's name and contractor number.

B. The application must verify that the contractor information is accurate as of the date of renewal. Contractor information includes information or items submitted with the contractor's initial license application, as amended by a notice of change.

C. The application must be accompanied by documentation showing compliance with the workers' compensation insurance coverage requirement of Minnesota Statutes, section 176.181, subdivision 2. The documentation must contain the name of the insurance company, the policy number, and dates of coverage, or the permit to self-insure.

D. The application must be accompanied by a license renewal fee of $500. If the application is submitted on or after June 1, the application must also be accompanied by a late fee of $50.

E. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements for a contractor of parts 7512.0400 to 7512.1200 and Minnesota Statutes, chapter 299M.

F. One person named on the application shall sign the application, verifying that the information on the application is true.

Subp. 3. **Reasons to refuse renewal.** To renew a contractor license, the contractor shall submit a completed license renewal application to the commissioner. The commissioner shall accept a renewal application any time on or before June 30. A person shall not perform fire protection-related work after the license has expired and before a renewal license is issued. The commissioner shall renew the license, unless there is a reason to refuse to renew. The commissioner shall refuse to renew for any of the following reasons:

A. The application does not meet the requirements of subpart 2.

B. The applicant is currently under revocation or suspension.

C. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

Subp. 4. **Application after lapse.** Within one year after a contractor license has expired, a former contractor may obtain another license by following the renewal procedures of this part. A contractor whose license has been expired for more than one year shall comply with all requirements and procedures of part 7512.0500 in order to obtain another license. A person may not perform fire protection-related work after the license has expired and before another license is issued.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*

Published Electronically: *November 8, 2006*

7512.0700 CHANGE IN CONTRACTOR LICENSE CONDITIONS.

Subpart 1. **Notice of change.** A fire protection contractor shall notify the commissioner of a change in contractor information. Contractor information is the current information that the commissioner has concerning a contractor. This information is based upon the information or items submitted by the contractor in its initial license application or updated change notices.

Subp. 2. **Form of notice.** A notice of change must be made on a form provided or approved by the commissioner and must meet the following conditions:

A. The notice of change must indicate the contractor information that has changed.

B. The notice of change must be accompanied by initial license items that have changed.

C. One owner, officer, board member, or managing employee shall sign the notice, verifying that the information on the notice is true.

D. A person who is removed as an owner, officer, board member, or managing employee shall sign the notice, verifying that the person has been removed. If it is not possible for this person to sign, the notice of change must contain the reason.

Subp. 3. **Timing of notice.** The contractor shall submit the notice of change so that it is received by the commissioner before the change occurs, unless this is not possible, in which case the contractor shall submit the notice as soon as reasonable.

Subp. 4. **License not transferable.** A fire protection contractor license may not be transferred from one person or organization to another. A successor contractor may not perform fire protection-related work until after the successor contractor has obtained another license. In addition, the successor contractor shall obtain a bond that is separate and distinct from the bond under the original license.

A contractor license issued to an individual, partnership, corporation, or limited liability company does not transfer to a new business entity created by a change in the form of ownership of the business.

A contractor license issued to a partnership becomes invalid when an original partner leaves the partnership or a new partner is brought into the partnership.

A contractor license issued to a corporation becomes invalid when the corporation is dissolved. A contractor license remains valid when a shareholder of the corporation or the name of the corporation is changed.

A contractor license issued to a limited liability company becomes invalid when the limited liability company is dissolved. A contractor license remains valid when a member of the limited liability company or the name of the limited liability company is changed.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.0800 CONTRACTOR'S MANAGING EMPLOYEE REQUIREMENTS.

Subpart 1. **Employment of managing employee.** A fire protection contractor shall employ a person who meets the requirements for a managing employee contained in parts 7512.1300 to 7512.1600. The managing employee shall supervise the performance of all fire protection-related work by the contractor.

Subp. 2. **Exceptions.** Except as provided in subparts 3 to 6, a contractor shall not perform fire protection-related work after the contractor loses its managing employee. A contractor loses its managing employee when the managing employee is no longer employed by the contractor or when the managing employee no longer meets the requirements of parts 7512.1300 to 7512.1600. The limitations and conditions of subparts 3 to 6 no longer apply to a contractor after the contractor employs a new managing employee who meets the requirements of parts 7512.1300 to 7512.1600.

Subparts 3 to 6 must not be interpreted to require the commissioner to issue a contractor license to an applicant for an initial contractor license who does not have a managing employee.

Subp. 3. **Notice to commissioner.** The contractor shall notify the commissioner within three days after the contractor loses its managing employee.

Subp. 4. **Fourteen-day grace period.** The contractor may continue performing fire protection-related work for a period of 14 days after the contractor loses its managing employee, provided the contractor:

A. notifies the commissioner under subpart 3; and

B. sufficiently supervises its work to ensure that the work is performed in compliance with the fire code and the building code and that worker safety is not compromised.

Subp. 5. **Continuing grace period.** The contractor may continue performing fire protection-related work after the end of the 14-day period under subpart 4 and until seven days after the results of the next managing employee examination are issued, if the contractor meets the following conditions:

A. the contractor designates an employee as acting managing employee;

B. the person designated by the contractor meets the qualifications of part 7512.1300 to take the managing employee examination;

C. the person designated by the contractor submits an application to take the next managing employee examination; and

D. the commissioner determines that the person designated by the contractor will likely pass the managing employee examination, based on the person's qualifications and experiences.

Subp. 6. **Deadline to designate new managing employee.** Within seven days after the results of the next managing employee examination are issued, the contractor either shall designate a new managing employee who meets the qualifications of parts 7512.1300 to 7512.1600 or shall discontinue performing fire protection-related work.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.0900 CONTRACTOR OPERATING REQUIREMENTS.

Subpart 1. **Posting of license.** A contractor shall post its contractor license issued under parts 7512.0500 and 7512.0600 in a conspicuous place in the contractor's place of business. A contractor shall display its contractor license number on all bids, proposals, offers, and installation drawings for fire protection systems.

Subp. 2. **Compliance with codes.** A contractor shall perform fire protection-related work so that the work is in compliance with the fire code and the building code.

Subp. 3. **Contractor employees.** A fire protection contractor may not employ a person to perform fire protection-related work unless the person is a managing employee, certified journeyman, or registered apprentice.

Subp. 4. **Supervision of apprentices.** A fire protection contractor shall ensure that an apprentice sprinkler fitter working for the contractor is under the direct supervision of a managing employee or journeyman sprinkler fitter. Direct supervision means that a managing employee or journeyman ensures that the apprentice is regularly engaged in learning the sprinkler fitter trade and oversees and directs the fire protection-related work performed by the apprentice such that:

A. the managing employee or journeyman actually reviews the work performed by the apprentice;

B. the managing employee or journeyman is on the job site and immediately available to the apprentice at all times for assistance and direction; and

C. the managing employee or journeyman is able to and does determine that work performed by the apprentice is performed in compliance with the fire code and the building code.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*
Published Electronically: *November 8, 2006*

7512.1000 INSURANCE AND BOND.

Subpart 1. **Insurance.** A fire protection contractor shall have a general liability insurance policy meeting the following requirements:

A. The policy must include products and completed operations coverage.

B. The limits of insurance coverage of the policy must be at least $250,000 per person and $500,000 per occurrence and property damage insurance with limits of at least $100,000.

C. The policy must be conditioned to pay, on behalf of the insured, those amounts that the insured is legally obligated to pay as damages because of bodily injury and property damage caused by an occurrence involving the insured or the insured's servant, officer, agent, or employee in the performance of fire protection-related work.

D. The term of the policy must be concurrent with the term of the license.

E. The policy must be executed by an insurer authorized to do business in Minnesota and countersigned by an insurance agent licensed in Minnesota.

F. The policy must contain a stipulation that the insurance may not be canceled, terminated, or changed in a way so that it no longer meets the requirements of this subpart, except upon 30 days' prior written notice to the commissioner.

Subp. 2. **Bond.** A contractor must have a bond meeting the following requirements:

A. The bond must be for the total penal sum of $30,000 conditioned upon the faithful and lawful performance of all work entered upon within the state.

B. The bond must be for the benefit of persons injured or suffering financial loss by reason of failure of performance.

C. The term of the bond must be concurrent with the term of the license.

D. The bond must be written by a corporate surety licensed to do business in the state, be a cash bond, or be an irrevocable line of credit.

E. The bond must contain a stipulation that the bond may not be canceled, terminated, or changed in a way so that it no longer meets the requirements of this subpart, except upon 30 days' prior written notice to the commissioner.

Subp. 3. **Failure to have insurance or bond.** Except as provided in subpart 4, a fire protection contractor shall not perform fire protection-related work if the contractor does not have insurance meeting the requirements of subpart 1 and a bond meeting the requirements of subpart 2.

Subp. 4. **Exceptions to insurance or bond requirements.** A fire protection contractor may, without the insurance or bond required by this part, perform fire protection-related work on premises or that part of premises actually occupied by the contractor and owned by the contractor or leased by the contractor for a period of at least one year.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.1100 PERMIT.

Subpart 1. **Authority having jurisdiction; permit requirements.** In areas of the state where a municipality reviews plans and inspects installations of fire protection systems, the municipality or the office or individual in the municipality responsible for plan review and inspection is the authority having jurisdiction. In all other areas of the state, the commissioner is the authority having jurisdiction for purposes of plan review and inspection. When required by the authority having jurisdiction, a fire protection contractor shall obtain a permit to perform fire protection-related work.

Subp. 2. **Cost of fire protection system.** When applying for a permit, the contractor shall give an estimate of the total cost of the components and labor of the fire protection system to the authority having jurisdiction. If the actual cost of the system is greater than the estimated cost, the contractor shall notify the authority having jurisdiction of this fact at the time of the final acceptance test.

Subp. 3. **Permit fee.** A fee for a permit to perform fire protection-related work may be charged at the discretion of and in an amount determined by the authority having jurisdiction. When the authority having jurisdiction is the commissioner, the contractor shall pay a permit fee to the commissioner. The permit fee must be the actual cost of the labor and components of the fire protection system multiplied by .012. When applying for the permit, the contractor shall pay an estimated fee based on the estimated cost of the system. If the actual cost of the system is greater than the estimated cost, the contractor shall pay any additional fee amount before the final acceptance test.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

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7512.1200 SURCHARGE.

Subpart 1. **Surcharge fee.** A fire protection contractor shall pay a surcharge fee on all fire protection-related work performed by the contractor. The amount of the surcharge fee must be the

actual cost of the labor and components of the fire protection system multiplied by .002. The contractor shall pay the surcharge fee to the commissioner.

Subp. 2. **Fee payment schedule.** The contractor shall pay the surcharge fee as follows:

A. If a bid is required for the project, the contractor shall pay the surcharge fee before starting the project. The amount of the fee must be based on the amount of the bid. If the actual cost of the fire protection system is greater than the amount of the bid, the contractor shall pay an additional surcharge fee prior to the final acceptance test of the fire protection system. The amount of the fee must be based on the difference between the actual cost of the fire protection system and the amount of the bid.

B. If a bid is not required for the project, the contractor shall pay the surcharge fee prior to the final acceptance test of the fire protection system. The amount of the fee must be based on the actual cost of the fire protection system.

Subp. 3. **Surcharge fee account.** A contractor may prepay surcharge fees to the commissioner. The commissioner shall hold any prepaid fees in an account in the contractor's name and shall use the account only for surcharge fees on fire protection systems by the contractor.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

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MANAGING EMPLOYEE

7512.1300 MANAGING EMPLOYEE EXAMINATION.

Subpart 1. **Application for examination.** An application for a managing employee examination must be on a form provided or approved by the commissioner and must meet the following requirements:

A. The application must contain the name, address, telephone number, date of birth, and driver's license number of the applicant. If the applicant does not have a driver's license, the application must contain the identification card number. If the applicant's driver's license or identification card was issued by another state or country, the application must list the name of the state or country.

B. The application must contain a history of fire protection contractor licensure or managing employee certification of the applicant. The history must be of each fire protection contractor license or managing employee certificate applied for or issued by Minnesota or by another jurisdiction and must include the issuance and expiration dates of the license or certificate. If the jurisdiction refused to issue, revoked, or suspended a license or certificate, the history must give the date and the reason.

C. The application must be accompanied by documentation that the applicant meets the qualifications to take the managing employee examination, as set out in subpart 2.

D. The application must be accompanied by a completed tax information form required by the commissioner of revenue under Minnesota Statutes, section 270C.72.

E. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements of parts 7512.1300 to 7512.1600 for a managing employee.

F. The applicant shall sign the application, verifying that the information in the application is true.

Subp. 2. **Qualifications for examination.** A person may take the managing employee examination if the person submits a completed application for examination and if the person meets one of the following qualifications:

A. The person has 10,000 hours of experience in designing, installing, modifying, or inspecting fire protection systems.

B. The person holds a Level III or IV certification by the National Institute for Certification in Engineering Technologies, in the field of fire protection, and in the subfield of automatic sprinkler system layout.

C. The person is licensed as a professional engineer under Minnesota Statutes, section 326.03, and is competent in fire protection system design.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*

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7512.1400 MANAGING EMPLOYEE CERTIFICATE.

Subpart 1. **Issuing certificate.** The commissioner shall issue a managing employee certificate and card to a person who is designated as a managing employee by a fire protection contractor, unless there is a reason to refuse to issue. The commissioner shall refuse to issue for any of the following reasons:

A. The person has not passed the managing employee examination and the person is not exempt under part 7512.0300 from the requirement to pass the examination.

B. The person has not met all continuing education requirements since passing the managing employee examination.

C. The person is not employed by the contractor.

D. The person is currently a managing employee for another contractor.

E. The person is currently under revocation or suspension as a fire protection contractor or managing employee.

F. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the person owes the state delinquent taxes, penalties, or interest.

G. The person does not meet the requirements for a managing employee set out in parts 7512.1300 to 7512.1600.

Subp. 2. **List of qualified managing employee candidates.** The commissioner shall maintain a list of persons who pass the managing employee examination, but who are not designated as a managing employee by a fire protection contractor. To remain on the list, a person shall fulfill continuing education requirements as they occur.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*
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7512.1500 MANAGING EMPLOYEE CERTIFICATE RENEWAL.

Subpart 1. **Certificate expiration date.** A managing employee certificate expires at midnight on June 30 of each year. A certificate is valid upon renewal until the following June 30.

Subp. 2. **Renewal application.** A renewal application for a managing employee certificate must be on a form provided or approved by the commissioner and must contain the following information:

A. The application must contain the managing employee's name and managing employee number.

B. The application must list any changes to the managing employee's address, telephone number, and driver's license number.

C. The application must be accompanied by documentation showing that the managing employee has met the continuing education requirements of subpart 5.

D. The application must be accompanied by a certificate renewal fee of $75. If the application is submitted on or after June 1, the application must also be accompanied by a late fee of $50.

E. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements of parts 7512.1300 to 7512.1600 for a managing employee.

F. The applicant shall sign the application, verifying that the information on the application is true.

Subp. 3. **Reasons to refuse renewal.** To renew a managing employee certificate, the managing employee shall submit a completed certificate renewal application to the commissioner. The commissioner shall accept a renewal application any time on or before June 30. A person shall not perform fire protection-related work after the certificate expires and before a renewal certificate is

issued. The commissioner shall renew the certificate, unless there is a reason to refuse to renew. The commissioner shall refuse to renew for any of the following reasons:

A. The application does not meet the requirements of subpart 2.

B. The applicant has not met the continuing education requirements of subpart 5.

C. The applicant obtained an initial certificate without passing an examination and the examination exemption period has expired without the applicant having passed the examination.

D. The applicant is currently under revocation or suspension.

E. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

Subp. 4. **Application after lapse.** Within one year after a managing employee certificate has expired, a former managing employee may obtain another certificate by following the renewal procedures of this part. A managing employee whose certificate has been expired for more than one year shall comply with all requirements and procedures of parts 7512.1300 and 7512.1400 in order to obtain another certificate. A person may not perform fire protection-related work after the expiration of a certificate and before another certificate is issued.

Subp. 5. **Continuing education.** During each licensing year, a managing employee shall attend ten hours of continuing education courses on the performance of fire protection-related work and on laws and rules governing the performance of fire protection-related work.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*
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7512.1600 CARD REQUIREMENT.

A managing employee shall carry the managing employee card and a picture identification while working as a managing employee. The managing employee shall make both the managing employee card and the picture identification available upon request by the commissioner or an authority having jurisdiction. The managing employee card is not transferable.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*
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JOURNEYMAN SPRINKLER FITTER

7512.1700 JOURNEYMAN SPRINKLER FITTER EXAMINATION.

Subpart 1. **Application for examination.** An application for a journeyman sprinkler fitter examination must be on a form provided or approved by the commissioner and must meet the following requirements:

A. The application must contain the name, address, telephone number, date of birth, and driver's license number of the applicant. If the applicant does not have a driver's license, the application must contain the identification card number. If the applicant's driver's license or identification card was issued by another state or country, the application must list the name of the state or country.

B. The application must be accompanied by documentation that the applicant meets the qualifications to take the journeyman examination, as set forth in subpart 2.

C. The applicant shall sign the application, verifying that the information in the application is true.

Subp. 2. **Qualifications for examination.** A person may take the journeyman examination if the person submits a completed application for examination and if the person meets one of the following qualifications:

A. The person has 8,000 hours of experience in performing fire protection-related work.

B. The person has completed a sprinkler fitter program where the person was regularly engaged in learning the trade under the direct supervision of a licensed fire protection contractor or journeyman sprinkler fitter, while registered with a state or federal approval agency.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.1800 JOURNEYMAN SPRINKLER FITTER CERTIFICATE.

Subpart 1. **Certificate required.** A journeyman sprinkler fitter shall obtain a journeyman sprinkler fitter certificate before performing fire protection-related work.

Subp. 2. **Application for certificate.** An initial application for a journeyman sprinkler fitter certificate must be on a form provided or approved by the commissioner and must meet the following requirements:

A. The application must contain the full name, address, telephone number, date of birth, and driver's license number of the applicant. If the applicant does not have a driver's license, the application must contain the identification card number. If the applicant's driver's license or identification card was issued by another state or country, the application must list the name of the state or country.

B. The application must contain a history of journeyman sprinkler fitter certification of the applicant. The history must be of each journeyman sprinkler fitter certificate applied for or issued by Minnesota or by another jurisdiction and must include the issuance and expiration dates of the certificate. If the jurisdiction refused to issue, revoked, or suspended a certificate, the history must give the date and the reason.

C. The application must be accompanied by documentation that the applicant passed the journeyman sprinkler fitter examination or that the applicant is exempt from examination under part 7512.0300.

D. The application must be accompanied by a completed tax information form required by the commissioner of revenue under Minnesota Statutes, section 270C.72.

E. The application must be accompanied by a certificate fee of $75.

F. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements for a journeyman of parts 7512.1700 to 7512.2000 and Minnesota Statutes, chapter 299M.

G. The applicant shall sign the application, verifying that the information in the application is true.

Subp. 3. **Issuing certificate.** Except as provided in subparts 4 and 5, the commissioner shall use the provisions of this subpart to determine whether to issue a journeyman sprinkler fitter certificate and card. The commissioner shall issue a journeyman certificate and card to an applicant, unless there is a reason to refuse to issue. The commissioner shall refuse to issue for the following reasons:

A. The application or items filed with the application do not meet the requirements of subpart 2.

B. The applicant has not passed the journeyman sprinkler fitter examination and the applicant is not exempt under part 7512.0300 from the requirement to pass the examination.

C. The applicant is currently under revocation or suspension.

D. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

E. The applicant does not meet the requirements for a journeyman set out in parts 7512.1700 to 7512.2000 and Minnesota Statutes, chapter 299M.

Subp. 4. **Limited certificate.** The commissioner shall issue a limited journeyman sprinkler fitter certificate and card to an applicant who is certified as competent to perform fire protection-related work by a licensed fire protection contractor who is the applicant's employer. To obtain a limited journeyman certificate, the applicant shall submit to the commissioner an application for a journeyman certificate. In addition to the information and items required by subpart 2, the application must contain the employer's certification that the applicant is competent to perform fire protection-related work, the types of fire protection-related work that the applicant is competent to perform, and documentation of the applicant's training and experience showing that the applicant is competent to perform the listed types of fire protection-related work. The application does not need to contain documentation that the applicant has passed the journeyman examination. A journeyman with a limited certificate is limited to working on premises or that part of premises actually occupied by the journeyman's employer and owned by the employer or leased by the

employer for a period of at least one year. A journeyman with a limited certificate is limited to working in areas of competence, as certified and documented by the journeyman's employer. A journeyman with a limited certificate may not perform fire protection-related work unless the journeyman is under the supervision of the employer's managing employee. The commissioner shall indicate the work limitations on the journeyman certificate and card.

Subp. 5. **Conditional certificate.** The commissioner shall issue a conditional journeyman sprinkler fitter certificate and card to an applicant who meets all the qualifications to take the journeyman sprinkler fitter examination, but who has not yet passed the examination. To obtain a conditional journeyman certificate, an applicant shall submit to the commissioner an application for a journeyman certificate and an application to take the journeyman examination. A journeyman with a conditional certificate may not perform fire protection-related work unless the journeyman is under the direct supervision of a journeyman who holds an unconditional and unlimited certificate. The commissioner shall indicate the condition on the journeyman certificate and card. A journeyman with a conditional certificate may work under the conditional certificate for a maximum period of six months, after which the person shall either pass the journeyman examination or discontinue performing fire protection-related work. A person who has obtained a conditional certificate may not obtain another conditional certificate for at least three years after the previous conditional certificate was issued.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*

Published Electronically: *November 8, 2006*

7512.1900 JOURNEYMAN SPRINKLER FITTER CERTIFICATE RENEWAL.

Subpart 1. **Certificate expiration date.** A journeyman sprinkler fitter certificate expires at midnight on June 30 of each year. A certificate is valid upon renewal until the following June 30.

Subp. 2. **Renewal application.** A renewal application for a journeyman certificate must be on a form provided or approved by the commissioner and must contain the following information:

A. The application must contain the journeyman's name and journeyman number.

B. The application must list any changes to the journeyman's address, telephone number, and driver's license number.

C. The application must be accompanied by documentation showing that the journeyman has met the continuing education requirements of subpart 5.

D. The application must be accompanied by a certificate renewal fee of $75. If the application is submitted on or after June 1, the application must also be accompanied by a late fee of $50.

E. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements for a journeyman of parts 7512.1700 to 7512.2000 and Minnesota Statutes, chapter 299M.

F. The applicant shall sign the application, verifying that the information on the application is true.

Subp. 3. **Reasons to refuse renewal.** To renew a journeyman certificate, the journeyman shall submit a completed certificate renewal application to the commissioner. The commissioner shall accept a renewal application at any time on or before June 30. A person may not perform fire protection-related work after the certificate expires and before a renewal certificate is issued. The commissioner shall renew the certificate, unless there is a reason to refuse to renew. The commissioner shall refuse to renew for any of the following reasons:

A. The application does not meet the requirements of subpart 2.

B. The applicant has not met the continuing education requirements of subpart 5.

C. The applicant obtained an initial certificate without passing an examination and the examination exemption period has expired without the applicant having passed the examination.

D. The applicant is currently under revocation or suspension.

E. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

Subp. 4. **Application after lapse.** Within one year after a journeyman certificate has expired, a former journeyman may obtain another certificate by following the renewal procedures of this part. A journeyman whose certificate has been expired for more than one year shall comply with all requirements and procedures of parts 7512.1700 and 7512.1800 in order to obtain another certificate. A person may not perform fire protection-related work after the expiration of a certificate and before another certificate is issued.

Subp. 5. **Continuing education.** During each licensing year, a journeyman shall attend ten hours of continuing education courses on the performance of fire protection-related work and on laws and rules governing the performance of fire protection-related work.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*

Published Electronically: *November 8, 2006*

7512.2000 JOURNEYMAN WORK REQUIREMENTS.

Subpart 1. **Competence.** A journeyman sprinkler fitter must be competent to perform fire protection-related work.

Subp. 2. **Card.** A journeyman sprinkler fitter shall carry the journeyman sprinkler fitter card and a picture identification while working as a journeyman. The journeyman shall make both the journeyman card and the picture identification available upon request by the commissioner or an authority having jurisdiction. The journeyman card is not transferable.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*
Published Electronically: *November 8, 2006*

APPRENTICE SPRINKLER FITTER

7512.2100 APPRENTICE SPRINKLER FITTER REGISTRATION.

Subpart 1. **Registration required.** An apprentice sprinkler fitter shall register with the commissioner before performing fire protection-related work.

Subp. 2. **Application for registration.** An initial application for an apprentice sprinkler fitter registration must be on a form provided or approved by the commissioner and must meet the following requirements:

A. The application must contain the full name, address, telephone number, date of birth, and driver's license number of the applicant. If the applicant does not have a driver's license, the application must contain the identification card number. If the applicant's driver's license or identification card was issued by another state or country, the application must list the name of the state or country.

B. The application must be accompanied by documentation that the applicant is in a sprinkler fitter program where the applicant is regularly engaged in learning the trade under the direct supervision of a licensed fire protection contractor or journeyman sprinkler fitter.

C. The application must be accompanied by documentation that the applicant is registered with a state or federal approval agency.

D. The application must be accompanied by a completed tax information form required by the commissioner of revenue under Minnesota Statutes, section 270C.72.

E. The application must be accompanied by a registration fee of $15.

F. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements for an apprentice of parts 7512.2100 to 7512.2300 and Minnesota Statutes, chapter 299M.

G. The applicant shall sign the application, verifying that the information in the application is true.

Subp. 3. **Issuing registration.** The commissioner shall issue an apprentice sprinkler fitter registration and card to an applicant, unless there is a reason to refuse to issue. The commissioner shall refuse to issue for the following reasons:

A. The application or items filed with the application do not meet the requirements of subpart 2.

B. The applicant is not regularly engaged in learning the trade under the direct supervision of a licensed fire protection contractor or journeyman sprinkler fitter.

C. The applicant is not registered with a state or federal approval agency.

D. The applicant is currently under revocation or suspension.

E. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

F. The applicant does not meet the requirements for an apprentice set forth in parts 7512.2100 to 7512.2300 and Minnesota Statutes, chapter 299M.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*
Published Electronically: *November 8, 2006*

7512.2200 REGISTRATION RENEWAL.

Subpart 1. **Registration expiration date.** An apprentice sprinkler fitter registration expires at midnight on June 30 of each year. A registration is valid upon renewal until the following June 30.

Subp. 2. **Renewal application.** A renewal application for an apprentice registration must be on a form provided or approved by the commissioner and must contain the following information:

A. The application must contain the apprentice's name and apprentice number.

B. The application must list any changes to the apprentice's address, telephone number, and driver's license number.

C. The application must be accompanied by documentation of progress in the apprentice's sprinkler fitter program.

D. The application must be accompanied by a registration renewal fee of $15. If the application is submitted on or after June 1, the application must also be accompanied by a late fee of $15.

E. The application must contain or be accompanied by other information requested by the commissioner as necessary to determine whether the applicant meets the requirements for an apprentice of parts 7512.2100 to 7512.2300 and Minnesota Statutes, chapter 299M.

F. The applicant shall sign the application, verifying that the information on the application is true.

Subp. 3. **Reasons to refuse renewal.** To renew an apprentice registration, the apprentice shall submit a completed registration renewal application to the commissioner. The commissioner shall accept a renewal application at any time on or before June 30. A person may not perform fire protection-related work after the registration expires and before a renewal registration is issued. The commissioner shall renew the registration, unless there is a reason to refuse to renew. The commissioner shall refuse to renew for any of the following reasons:

A. The application does not meet the requirements of subpart 2.

B. The applicant fails to make satisfactory progress in the applicant's sprinkler fitter program.

C. The applicant is currently under revocation or suspension.

D. The commissioner of revenue notifies the commissioner of public safety under Minnesota Statutes, section 270C.72, that the applicant owes the state delinquent taxes, penalties, or interest.

Subp. 4. **Application after lapse.** Within one year after an apprentice registration has expired, a former apprentice may obtain another registration by following the renewal procedures of this part. An apprentice whose registration has been expired for more than one year shall comply with all requirements and procedures of part 7512.2100 in order to obtain another registration. A person may not perform fire protection-related work after the registration expires and before another registration is issued.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870; L 2005 c 151 art 1 s 116*
Published Electronically: *November 8, 2006*

7512.2300 APPRENTICE WORK REQUIREMENTS.

Subpart 1. **Active in approved program.** An apprentice shall annually make satisfactory progress in the apprentice's sprinkler fitter program.

Subp. 2. **Card.** An apprentice sprinkler fitter shall carry an apprentice sprinkler fitter card and a picture identification while working as an apprentice. An apprentice shall make both the apprentice card and the picture identification available upon request by the commissioner or an authority having jurisdiction. The apprentice card is not transferable.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*
Published Electronically: *November 8, 2006*

EXAMINATIONS

7512.2400 EXAMINATIONS.

Subpart 1. **Examination specifications.** An examination must test for knowledge of the statutes and rules regulating the managing employee or journeyman and for the knowledge and ability to perform fire protection-related work in a competent, lawful, and safe manner.

Subp. 2. **Examination administration.** The commissioner shall develop and administer the examination. The commissioner may contract with a professional examination service to develop and administer the examination.

Subp. 3. **Examination application.** A completed examination application must include a nonrefundable examination fee.

Subp. 4. **Retesting.** An examinee who fails an examination one time may not repeat the examination for 60 days from the date of the failed examination. An examinee who fails the examination more than once may not repeat the examination for 180 days from the date of the failed examination.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

REVOCATION AND SUSPENSION

7512.2500 ACTS ATTRIBUTED TO CONTRACTOR.

The commissioner shall revoke or suspend the fire protection contractor license of a partnership, corporation, or limited liability company if an owner, officer, board member, or managing employee acts or fails to act as would be cause to revoke or suspend the license of that person as an individual.

A contractor is responsible for an act of a person while that person is acting as an employee of the contractor, if the contractor authorizes or ratifies the act or if the contractor retains the benefits of the act after actual knowledge of the act.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.2600 REVOCATION.

Subpart 1. **Grounds for revocation.** The commissioner shall revoke a contractor license, managing employee certificate, journeyman certificate, or apprentice registration when the person holding the license, certificate, or registration has committed an act or has failed to perform a duty that constitutes grounds for revocation, which include the following:

A. The person knowingly or negligently performs fire protection-related work in a manner that would result in an immediate threat to life if a fire were to occur.

B. The person commits an act or fails to perform a duty that is grounds for suspension under part 7512.2700 and there are three suspensions on the person's record within the past five years.

C. The person submits a fraudulent application.

D. The person is convicted of a felony or gross misdemeanor related to the business of fire protection systems.

E. The person performs fire protection-related work during a suspension imposed under part 7512.2700.

Subp. 2. **Additional grounds for contractor license revocation.** In addition to those grounds listed in subpart 1, grounds for revocation of a fire protection contractor license include the following:

A. The contractor performs fire protection-related work during a period of time when the contractor's insurance or bond fails to meet the requirements of part 7512.1000.

B. The certificate of the managing employee of the contractor is revoked.

Subp. 3. **Additional grounds for managing employee certificate revocation.** In addition to those grounds listed in subpart 1, grounds for revocation of a managing employee certificate include: The license of the contractor of the managing employee is revoked.

Subp. 4. **Revocation period and effect.** A contractor license, managing employee certificate, journeyman certificate, or apprentice registration is not valid after it is revoked. A person may not perform fire protection-related work during a revocation. An owner, officer, board member, or managing employee of a revoked contractor may not be an owner, officer, board member, or managing employee of another contractor during a revocation. When a license, certificate, or registration is revoked, the person holding the license, certificate, or registration shall immediately surrender it. The length of revocation is as follows:

A. The commissioner shall use this item to determine the length of revocation if the revocation is based solely or in part on a conviction of crime or crimes as defined in Minnesota Statutes, section 364.02, subdivision 5. The revocation lasts until competent evidence is presented to the commissioner that the person convicted has been sufficiently rehabilitated under the criteria of Minnesota Statutes, section 364.03, subdivision 3.

B. If the length of revocation is not determined under item A, the length of revocation is one year.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.2700 SUSPENSION.

Subpart 1. **Grounds for suspension.** The commissioner shall suspend a contractor license, managing employee certificate, journeyman certificate, or apprentice registration when the person holding the license, certificate, or registration has committed an act or has failed to perform a duty that constitutes grounds for suspension. Grounds for suspension include the following:

A. The person willfully violates a provision of this chapter or Minnesota Statutes, chapter 299M, that is not specifically set out in part 7512.2600.

B. The person willfully violates or refuses to comply with a lawful request or order of the commissioner.

C. The person is convicted of a misdemeanor related to the business of fire protection systems.

Subp. 2. **Additional grounds for contractor license suspension.** In addition to those grounds listed in subpart 1, grounds for suspension of a fire protection contractor license include the following:

A. The certificate of the managing employee of the contractor is suspended.

B. The contractor adds an owner, officer, board member, or managing employee who would be ineligible to hold a contractor license as an individual. This provision does not constitute grounds for suspension if the contractor acted without knowledge of the person's ineligibility and if the contractor removes the person before the date scheduled for the hearing on the suspension.

C. The contractor fails to pay the commissioner a surcharge fee due from the contractor within ten days after the notice that a surcharge fee is required to be paid.

Subp. 3. **Additional grounds for managing employee certificate suspension.** In addition to those grounds listed in subpart 1, grounds for suspension of a managing employee certificate include: The license of the contractor of the managing employee is suspended.

Subp. 4. **Description of willfully.** For purposes of this part, the term "willfully":

A. describes an intentional act or omission by a person when the person knows or should reasonably know that the act or omission violates a law, rule, request, or order and the person is able to comply with the law, rule, request, or order; and

B. also describes an act or omission by a person, whether intentional or unintentional, when:

(1) the person uses a business or construction practice that makes it likely that the act or omission will occur;

(2) the commissioner has given written notice to the person within the past three years that the person's license, certificate, or registration may be suspended or revoked if the business or construction practice is not corrected;

(3) the person has failed to correct the business or construction practice within a reasonable time after receiving the notice; and

(4) the person's failure to correct the business or construction practice is a significant factor in causing the act or omission.

Subp. 5. **Suspension period and effect.** A contractor license, managing employee certificate, journeyman certificate, or apprentice registration is not valid during a suspension. A person may not perform fire protection-related work during a suspension. When a license, certificate, or registration is suspended, the person holding the license, certificate, or registration shall immediately surrender it. After a suspension period ends, the commissioner shall return the license, certificate, or registration. A suspension period ends after the last day of the period regardless of whether this day falls on a Saturday, Sunday, or legal holiday. The suspension period is as follows:

A. The suspension period is seven days, if there are no suspensions on the person's record within the past five years. This suspension period may be shortened if there are mitigating

circumstances that indicate a shorter suspension period is appropriate. The suspension period must be at least three days.

B. The suspension period is 14 days, if there is one suspension on the person's record within the past five years. This suspension period may be shortened if there are mitigating circumstances that indicate a shorter suspension period is appropriate. The suspension period must be at least seven days.

C. The suspension period is 28 days, if there are two suspensions on the person's record within the past five years. This suspension period may be shortened if there are mitigating circumstances that indicate a shorter suspension period is appropriate. The suspension period must be at least 14 days.

D. When a suspension period is shortened based on mitigating circumstances, the commissioner shall in writing identify the mitigating circumstances and give the reasons for shortening the suspension period.

E. The suspension of a contractor, in addition to being on the record of the suspended contractor, is also on the record of another contractor if an owner, officer, board member, or managing employee of the other contractor was an owner, officer, board member, or managing employee of the suspended contractor at the time of the acts leading to the suspension.

F. When a suspension is imposed for a continuing violation, the suspension must last until the suspension period determined under items A to E expires or until the violation is corrected, whichever is later.

Subp. 6. **Hearing.** A person against whom the commissioner takes disciplinary action is entitled to a hearing pursuant to Minnesota Statutes before disciplinary action is imposed. A person aggrieved by the commissioner's action may request a hearing before the commissioner. Minnesota Statutes, sections 14.57 to 14.69, apply to the hearing and to any subsequent proceedings.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*

Published Electronically: *November 8, 2006*

7512.2750 CIVIL PENALTY.

Subpart 1. **Proceeding against contractor, manager, journeyman; good cause.** When the commissioner has good cause to believe a fire protection contractor, managing employee, or journeyman is engaging or has engaged in conduct that violates Minnesota Statutes, chapter 299M, or a rule adopted under Minnesota Statutes, section 299M.04, the commissioner, in place of or in addition to licensing sanctions allowed under that chapter 299M or any rule adopted under that section 299M.04, shall impose a civil penalty upon the fire protection contractor, managing employee, or journeyman.

Subp. 1a. **Definition of good cause to believe.** For purposes of this part, "good cause to believe" means grounds put forth in good faith that are not arbitrary, irrational, unreasonable, or irrelevant and that are based on at least one of the following sources:

A. written information from an identified person;

B. facts supplied by a contractor, managing employee, journeyman sprinkler fitter, or municipality;

C. facts of which the commissioner, or an agent of the commissioner, has personal knowledge; or

D. information obtained by the department during an inspection.

Subp. 2. **Maximum penalty.** Penalties imposed must not be greater than $1,000 for each violation of Minnesota Statutes, chapter 299M, or rule adopted under Minnesota Statutes, section 299M.04, for each day of violation.

Subp. 3. **Assessment factors.** When determining the amount of penalty to be assessed, the commissioner shall consider:

A. those factors listed in Minnesota Statutes, section 14.045, subdivision 3, paragraph (a);

B. the following factors:

(1) the degree of the person's culpability;

(2) the person's ability to pay;

(3) good faith on the part of the person in attempting to remedy the cause of the violation; and

(4) the effect of the penalty on the person's ability to continue in business; and

C. for a second or succeeding violation, the factors listed in items A and B and listed in Minnesota Statutes, section 14.045, subdivision 3, paragraph (b).

Subp. 4. **Notice of civil penalty.** The commissioner shall issue a notice of civil penalty when the commissioner has good cause to believe a violation of Minnesota Statutes, chapter 299M, or any rule adopted under Minnesota Statutes, section 299M.04, has occurred.

A. The contents of a notice of civil penalty must include:

(1) a statement of the statute or rule allegedly violated and a description of the evidence on which the allegation is based;

(2) notice of response options available; and

(3) the amount of the civil penalty proposed.

B. The subject of the penalty shall respond to the notice within 15 days. The subject may select one or more of the following options for response:

(1) pay the penalty and close the case;

(2) submit an offer in compromise of the proposed civil penalty;

(3) submit a written explanation, information, or other material in answer to the allegations or in mitigation of the proposed civil penalty; or

(4) request the commissioner to initiate a hearing under Minnesota Statutes, sections 14.50 to 14.69.

C. The commissioner shall review any written explanations, information, or other materials that are submitted in response to a notice of civil penalty. The commissioner shall determine whether to enforce, negotiate, modify, or withdraw the notice or to initiate a hearing under Minnesota Statutes, sections 14.57 to 14.69.

Subp. 5. **Payment procedure.** The subject of the civil penalty shall pay the penalty that has been assessed and proposed, or compromised, by submitting to the commissioner a check or money order in the correct amount, payable to the commissioner of public safety, to be deposited in the state treasury and credited to the general fund.

Subp. 6. **Other enforcement provisions.** Unless the commissioner determines that other enforcement provisions are unnecessary or inapplicable to the particular violation at issue, neither payment of the civil penalty nor negotiation, modification, or withdrawal of the notice of civil penalty prohibits:

A. the commissioner from pursuing other enforcement provisions provided for in Minnesota Statutes, chapter 299M, and rules adopted under Minnesota Statutes, section 299M.04; or

B. the subject of the civil penalty from abiding by the terms of other enforcement provisions.

Subp. 7. **Hearings.** A penalty imposed under Minnesota Statutes, section 299M.04, is subject to the contested case and judicial review provisions of Minnesota Statutes, chapter 14.

Statutory Authority: *MS s 299M.04*

History: *24 SR 1780*
Published Electronically: *November 8, 2006*

7512.2770 CEASE AND DESIST ORDER.

Subpart 1. **Cease and desist order; immediate risk.** The commissioner shall issue an order to cease and desist an activity that violates Minnesota Statutes, chapter 299M, or any rule adopted under Minnesota Statutes, section 299M.04, and is considered to be an immediate risk to public health or public safety. Generally, a cease and desist order under this part is appropriate if an individual or group is in danger of specific harmful consequences in the immediate future if an action or activity goes unchecked.

Subp. 2. **Contents of order.** An order to cease and desist an activity must be in writing and include the following:

A. the reasons for issuing the order and a statement of the evidence compiled;

B. the statute, rule, variance, order, or term or condition of a permit that was violated, if any;

C. the length of time the order is effective; and

D. notice that a contested case hearing will be held within seven working days.

Subp. 3. **Maximum length of order.** An order issued under this part is valid for no longer than 20 working days.

Subp. 4. **Public notice.** The commissioner, in conjunction with a cease and desist order, may physically tag each violation. This public notice must contain the information required for an order under subpart 2, items A to C.

Subp. 5. **Administrative hearings.** The commissioner shall initiate proceedings for a contested case hearing according to Minnesota Statutes, sections 14.57 to 14.69, of the Minnesota Administrative Procedure Act, and items A to C:

A. An administrative hearing must be held within seven working days of issuing the cease and desist order.

B. The administrative law judge shall issue an order to vacate, modify, or make permanent a cease and desist order within five working days of the administrative hearing.

C. If the person to whom the order is issued fails to appear at a hearing after notice of the hearing, the party is in default and the cease and desist order becomes permanent.

Subp. 6. **Noncompliance.** In the event of noncompliance with a cease and desist order, in addition to licensing sanctions allowed under Minnesota Statutes, chapter 299M, or any rule adopted under Minnesota Statutes, section 299M.04, the commissioner shall assess a civil penalty as set forth in part 7512.2750 and Minnesota Statutes, section 299M.04.

Subp. 7. **Other enforcement.** Issuance of a cease and desist order does not preclude the commissioner from pursuing other enforcement actions available to the commissioner.

Subp. 8. **Elimination of immediate risk.** The commissioner shall vacate the cease and desist order when the person proves that the immediate risk to public health or public safety has been eliminated.

Subp. 9. **Determination that no immediate risk remains.** When the person asserts that the situation has been resolved so that no immediate risk remains, the commissioner shall verify that assertion according to items A to D:

A. review all information related to the issuance of the order to determine if violations have been corrected and there is no longer an immediate risk;

B. as may be reasonable under the facts of the case, verify with a site visit, reinspection, examination of documentation, or other means;

C. on determining that the situation has been corrected so that no immediate risk remains, notify the person within 36 hours and lift the cease and desist order; and

D. document a determination that the situation has been corrected in case further infractions, incidents, or situations occur involving the person at issue.

Statutory Authority: *MS s 299M.04*

History: *24 SR 1780*
Published Electronically: *November 8, 2006*

MUNICIPAL PERMIT PROGRAMS

7512.2800 MUNICIPAL PERMIT PROGRAM.

Subpart 1. **Permits required by ordinance.** A municipality, through local ordinance, may require a permit to perform fire protection-related work. The municipality shall submit to the commissioner a copy of ordinances pertaining to fire protection system permits. For ordinances adopted before June 1, 1994, a copy must be submitted by July 1, 1994. For ordinances adopted on or after June 1, 1994, a copy must be submitted within 30 days of the date of adoption of the ordinance. The submittal must include documentation of training for the persons who will conduct the plan reviews and inspections.

Subp. 2. **Plan review and inspection program.** When a municipality issues a permit, the municipality shall provide a competent plan review conducted by a person trained in fire protection system plan review. The municipality shall also provide a competent inspection conducted by a person trained in fire protection system inspection. The municipality shall document the permit program and make it available to the commissioner for review.

Subp. 3. **Municipal reporting.** At least once a year, a municipality issuing permits shall submit a report to the commissioner indicating all permits that have been issued by the municipality for fire protection systems. This report must include the name, address, type of fire protection system installed, contractor license number, and occupancy type of the structure for which the permit was issued.

Statutory Authority: *MS s 299M.04*

History: *18 SR 1870*
Published Electronically: *April 8, 2022*

CHAPTER 299M

FIRE PROTECTION INDUSTRY LICENSING

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299M.01 DEFINITIONS.

Subdivision 1. **Scope.** For the purposes of this chapter, the following terms have the meanings given them in this section.

Subd. 2. **Apprentice sprinkler fitter.** "Apprentice sprinkler fitter" means a person, other than a fire protection contractor or journeyman sprinkler fitter, who is regularly engaged in learning the trade under the direct supervision of a licensed fire protection contractor or journeyman sprinkler fitter and is registered with a state or federal approval agency.

Subd. 3. **Commissioner.** "Commissioner" means the commissioner of public safety.

Subd. 4. **Council.** "Council" means the Minnesota Advisory Council on Fire Protection Systems.

Subd. 5. **Department.** "Department" means the Department of Public Safety.

Subd. 6. **Fire protection contractor.** "Fire protection contractor" means a person who contracts to sell, design, install, modify, alter, or inspect a fire protection system or its parts or related equipment.

Subd. 7. **Fire protection system.** "Fire protection system" means a sprinkler, standpipe, hose system, or other special hazard system for fire protection purposes only, that is composed of an integrated system of underground and overhead piping connected to a water source. "Fire protection system" does not include the water service piping to a city water main, or piping used for potable water purposes, or piping used for heating or cooling purposes. Openings from potable water piping for fire protection systems must be made by persons properly licensed under section 326B.46. Persons properly licensed under section 326B.46 may also sell, design, install, modify or inspect a standpipe, hose system only.

Subd. 8. **Journeyman sprinkler fitter.** "Journeyman sprinkler fitter" means a person who is certified as competent to engage in installing, connecting, altering, repairing, or adding to a fire protection system for and under the supervision of a fire protection contractor.

Subd. 8a. **Multipurpose potable water piping system contractor.** "Multipurpose potable water piping system contractor" means a person who contracts to sell, design, install, modify, or inspect a multipurpose potable water piping system, its parts, or related equipment.

Subd. 8b. **Multipurpose potable water piping system.** "Multipurpose potable water piping system" means a potable water piping system that is intended to serve both domestic and fire protection needs throughout a one- or two-family dwelling unit. No person may install a multipurpose potable water piping system unless that person is licensed pursuant to section 326B.46 and is certified pursuant to section 299M.03.

Subd. 8c. **Multipurpose potable water piping system installer.** "Multipurpose potable water piping system installer" means a person who is certified as competent to engage in installing, connecting, altering,

repairing, or adding to a residential multipurpose potable water piping system in a one- or two-family dwelling unit.

Subd. 9. **Municipality.** "Municipality" means a town or statutory or home rule charter city.

History: *1992 c 508 s 1; 1998 c 367 art 11 s 10; 1Sp2003 c 2 art 4 s 14-16; 2007 c 140 art 6 s 15; art 13 s 4*

299M.02 [Repealed, 2014 c 286 art 6 s 9]

299M.03 LICENSE OR CERTIFICATE REQUIRED.

Subdivision 1. **Contractor license.** Except for residential installations by the owner of an occupied one- or two-family dwelling, a person may not sell, design, install, modify, or inspect a fire protection system, its parts, or related equipment, or offer to do so, unless annually licensed to perform these duties as a fire protection contractor. No license is required under this section for a person licensed as a professional engineer under section 326.03 who is competent in fire protection system design or a person licensed as an alarm and communication contractor under section 326B.34 for performing activities authorized by that license.

Subd. 1a. **Multipurpose potable water piping system contractor license.** Except for residential installations by the owner-occupant of a one- or two-family dwelling, a person may not sell, design, install, modify, or inspect a multipurpose potable water piping system, its parts, or related equipment, or offer to do so, unless annually licensed to perform these duties as a multipurpose potable water piping system contractor. No license is required under this section for a person licensed as a professional engineer under section 326.03 who is competent in fire protection system design.

Subd. 2. **Journeyman certificate.** Except for residential installations by the owner of an occupied one- or two-family dwelling, a person may not install, connect, alter, repair, or add to a fire protection system, under the supervision of a fire protection contractor, unless annually certified to perform those duties as a journeyman sprinkler fitter or as a registered apprentice sprinkler fitter. This subdivision does not apply to a person maintaining or repairing a fire protection system if the system is located in a facility regulated under the federal Mine Safety and Health Act of 1977, United States Code, title 30, section 801 et seq.

Subd. 3. **Multipurpose potable water piping system installer certificate.** Except for residential installations by the owner-occupant of a one- or two-family dwelling, a person may not install, connect, alter, repair, or add to a multipurpose potable water piping system, unless annually certified to perform these duties as a multipurpose potable water piping system installer. A multipurpose potable water piping system installer certificate only allows the certificate holder to work on one- and two-family residential units.

Subd. 4. **Certification fee; annual appropriation.** The state fire marshal shall charge $55 to conduct and administer the journeyman sprinkler fitter certification process. Money received by the State Fire Marshal Division for the administration of this program must be deposited in the state treasury and credited to a state fire marshal dedicated account in the special revenue fund. All money in the state fire marshal account is annually appropriated to the commissioner of public safety to administer this program.

History: *1992 c 508 s 3; 1995 c 265 art 2 s 27; 1998 c 367 art 11 s 12,13; 1Sp2003 c 2 art 4 s 17-19; 2007 c 140 art 5 s 32; art 13 s 4; 2008 c 300 s 19; 2011 c 76 art 1 s 50*

299M.04 RULES, FEES, ORDERS, PENALTIES.

The commissioner shall adopt permanent rules for operation of the council; regulation by municipalities; qualifications, examination, and licensing of fire protection contractors; licensing of multipurpose potable

water piping system contractors; certification of multipurpose potable water piping system installers; certification of journeyman sprinkler fitters; registration of apprentices; and the administration and enforcement of this chapter. Permit fees must be a percentage of the total cost of the fire protection work.

The commissioner may issue a cease and desist order to cease an activity considered an immediate risk to public health or public safety. The commissioner shall adopt permanent rules governing when an order may be issued; how long the order is effective; notice requirements; and other procedures and requirements necessary to implement, administer, and enforce the provisions of this chapter.

The commissioner, in place of or in addition to licensing sanctions allowed under this chapter, may impose a civil penalty not greater than $1,000 for each violation of this chapter or rule adopted under this chapter, for each day of violation. The commissioner shall adopt permanent rules governing and establishing procedures for implementation, administration, and enforcement of this paragraph.

History: *1992 c 508 s 4; 1996 c 305 art 3 s 31; 1998 c 367 art 11 s 14; 1999 c 250 art 3 s 26; 1Sp2003 c 2 art 4 s 20*

299M.05 [Repealed, 1998 c 367 art 11 s 27]

299M.06 REVOCATION, SUSPENSION, REFUSAL.

The commissioner may revoke, suspend, or refuse to issue or renew a license or certificate issued under this chapter. Any person aggrieved by the commissioner's action may request a hearing before the commissioner. The provisions of sections 14.57 to 14.69 apply to the hearing and to any subsequent proceedings.

History: *1992 c 508 s 6*

299M.07 MUNICIPAL REGULATION.

A municipality by ordinance may require payment of permit fees for competent inspection of fire protection systems.

A municipality enacting an ordinance after July 1, 1992, shall notify the commissioner of public safety.

A municipality may not require licensing, certification, registration, bonding, or insurance that is in addition to the state requirements outlined under this chapter.

History: *1992 c 508 s 7*

299M.08 MISDEMEANOR.

It is a misdemeanor for any person to intentionally commit or direct another person to commit either of the following acts:

(1) to make a false statement in a license application, request for inspection, certificate, or other form or statement authorized or required under this chapter; or

(2) to perform fire protection system work without a proper permit, when required, or without a license or certificate for that work.

History: *1992 c 508 s 8; 1998 c 367 art 11 s 15*

299M.09 AUTHORITY TO CONTRACT.

The commissioner may contract for services with local units of government.

History: *1992 c 508 s 9*

299M.10 MONEY CREDITED TO GENERAL FUND.

The fees and penalties collected under this chapter, except as provided in section 299M.07, must be deposited in the state treasury and credited to the general fund. Money received by the State Fire Marshal Division in the form of gifts, grants, reimbursements, or appropriation from any source for the administration of this chapter must also be deposited in the state treasury and credited to the general fund.

History: *1992 c 508 s 10*

299M.11 FEES.

Subdivision 1. **Licensing fee.** A person required to be licensed under section 299M.03, subdivision 1 or 1a, shall, before receipt of the license and before causing fire protection-related work or multipurpose potable water piping system work to be performed, pay the commissioner an annual license fee.

Subd. 2. **Certification fee.** Employees required to be certified under section 299M.03, subdivision 2 or 3, shall, before performing fire protection-related work or multipurpose potable water piping system work, pay the commissioner an annual certification fee.

Subd. 3. **Registration fee.** Employees required to be registered under section 299M.03, subdivision 2, shall, before performing fire protection-related work, pay the commissioner an annual registration fee.

Subd. 4. **Surcharge fee.** Before beginning fire protection-related work, a fire protection contractor shall pay a project surcharge fee to the commissioner based on a percentage of the total costs of the fire protection-related work.

Subd. 5. **Deposit of fees.** Fees collected under this section must be deposited in the state treasury and credited to the general fund.

History: *1992 c 508 s 11; 1Sp2003 c 2 art 4 s 21,22*

299M.12 CONFLICTS OF LAWS.

This chapter is not intended to conflict with and does not supersede the State Building Code or the State Fire Code.

History: *1992 c 508 s 12; 1998 c 367 art 11 s 16; 2005 c 136 art 9 s 14*