

## CHAPTER 9 FIRE PROTECTION SYSTEMS

### SECTION FC 901 GENERAL

**901.1 Scope.** This chapter shall govern the design, installation, operation and maintenance, including inspection and testing, of fire protection devices, equipment and systems, and other fire protection measures for the control and extinguishment of fire.

**901.1.1 General.** Fire protection systems shall be designed, installed, operated and maintained in accordance with this chapter and the reference standards set forth in FC Table 901.6.1.

**901.2 Design and installation documents.** The commissioner may require design and installation documents and calculations to be submitted for review for all fire protection systems. Design and installation documents required or regulated by this code or the rules shall be submitted for review and approval prior to installation, and shall certify that the design complies with the requirements of this code and the rules.

**901.3 Permits.** Permits shall be required as set forth in FC105.6.

**901.4 Design and installation.** Fire protection systems shall be designed and installed in accordance with FC 901.4.1 through 901.4.5.

**901.4.1 Required fire protection systems.** Fire protection systems shall be designed and installed in accordance with the construction codes, including the Building Code, and, as applicable, this code and the rules, and the applicable referenced standards listed in this code. Required systems shall be extended or altered as necessary to maintain and continue protection whenever the building or structure is altered. Alterations to fire protection systems shall be performed in compliance with the requirements of this code, the rules, and the construction codes, as applicable. Buildings and structures shall be provided with such fire hose, portable fire extinguishers and other means of preventing and extinguishing fires as the commissioner may direct.

**901.4.2 Fire protection systems not required by code.** Any fire protection system or portion thereof not required by this code, the rules or the construction codes, including the Building Code, may be installed to provide partial or complete protection of a building or structure, provided such system meets the requirements of this code, the rules and the construction codes, including the Building Code, as applicable. Where the design and installation of such fire protection system is governed by this code or the rules, the commissioner may modify such requirements, consistent with the interests of fire safety, upon a determination that such modification will promote public safety by encouraging the installation of such systems.

**901.4.3 Additional fire protection systems.** Where an existing or proposed storage, handling or use of a material or the conduct of an operation in a particular occupancy gives

rise to special hazards in addition to the normal hazards of the occupancy, or where the commissioner determines that size, design and arrangement of the occupancy would unduly delay the ability of firefighting personnel to gain access to the hazard, the commissioner may require additional fire protection or other fire safety measures. Such measures may include the following: automatic fire detection systems, fire alarm systems, fire extinguishing systems, standpipe systems, or portable or fixed extinguishers. Where a certificate of occupancy limits the commissioner's authority to order the installation of such additional systems or the implementation of such additional measures, the commissioner may apply to the Board of Standards and Appeals for a modification of such certificate of occupancy, and such application shall be granted upon a showing that such additional systems or measures will reasonably mitigate the special hazard or delayed access.

**901.4.4 Prohibition of deceptive equipment.** It shall be unlawful to install or maintain any device that has the physical appearance of fire protection equipment but that does not perform the fire protection function, in any building, structure or premises where it may be confused with actual fire protection equipment.

**901.4.5 Certificate of approval.** The following fire protection devices, equipment and systems shall be of a type for which a certificate of approval has been issued in accordance with this code, or which was approved by the Department of Buildings or the Board of Standards and Appeals prior to the effective date of this section, unless such approval by the Department of Buildings or the Board of Standards and Appeals is amended or repealed by the commissioner:

1. Pre-engineered non-water fire extinguishing systems, including systems installed in connection with commercial cooking systems.
2. Prefabricated hoods and grease filters installed in connection with commercial cooking systems.
3. Fire department connections, standpipe system hose outlets and pressure reducing valves.
4. Fire alarm control units, and medical gas, toxic, highly toxic and flammable gas detection system control panels.

**901.5 Installation acceptance testing.** Fire detection and alarm systems, fire extinguishing systems, private fire hydrant systems, yard hydrant systems, 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 set forth in the installation standards specified in this code. Where required by the construction codes, including the Building Code, this code or the rules, such tests shall be conducted, at the owner's risk, by his or her representative before a representative of the department.

**901.5.1 Occupancy.** It shall be unlawful to occupy any portion of a building or structure until any required fire detection system, fire alarm system, standpipe system and fire extinguishing systems have been tested and approved.

**901.6 Maintenance.** Fire protection systems shall be maintained in good working order at all times. Any fire protection system that is not in good working order shall be repaired or replaced as necessary to restore such system to good working order, or, where authorized by the Building Code, removed from the premises.

**901.6.1 Standards.** Fire protection systems shall be inspected, tested, serviced and otherwise maintained in accordance with this section, the rules and the referenced standards listed in FC Table 901.6.1. Where required by this section, such inspection, testing and maintenance shall additionally comply with the rules. Where applicable, the requirements of the reference standards listed in FC Table 901.6.1 shall be in addition to those requirements specified in the rules.

**FC TABLE 901.6.1  
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS**

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Low, medium and high expansion foam systems	NFPA 11 and NFPA 25
Carbon dioxide fire extinguishing system	NFPA 12
Halon 1301 fire extinguishing systems	NFPA 12A
Foam water sprinkler and spray systems	NFPA 16 and NFPA 25
Dry chemical fire extinguishing systems	NFPA 17
Wet chemical fire extinguishing systems	NFPA 17A
Water based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Water mist fire extinguishing systems	NFPA 750
Clean agent fire extinguishing systems	NFPA 2001
Aerosol fire extinguishing systems	NFPA 2010

**901.6.2 Records.** Records of all system inspections, tests, servicing and other maintenance required by this code, the rules or the referenced standards shall be maintained in accordance with FC107.7.

**901.6.2.1 Standpipe and sprinkler systems.** In addition to those records required by NFPA 25, an approved card bearing the dates of each inspection, certificate of fitness number and signature of the certificate of fitness holder shall be posted on the premises near the main water supply control valve. A detailed inspection report relative to conditions of water supply, gravity and pressure tanks and levels therein, valves, risers, piping, sprinkler heads, hose valves, hose and nozzles, fire department connections, alarms, fire pumps, obstructions, and conditions of all other system equipment and appurtenances shall be completed monthly by the certificate of fitness holder. All defects or violations shall be noted on the inspection report.

**901.6.3 Supervision.** A person holding a certificate of fitness for the following fire protection systems shall personally supervise the inspection, testing, servicing and other maintenance required by this code or the rules with respect to the system supervised by such certificate of fitness holder:

1. Sprinkler systems.

**Exception:** Buildings classified in Group R-3 occupancies.

2. Standpipe systems.
3. Foam fire extinguishing systems.
4. Fire alarm systems.
5. Private fire hydrant systems.
6. Yard hydrant systems.

**901.6.3.1 Servicing of portable fire extinguishers.** It shall be unlawful for any person engaged in the business of servicing portable fire extinguishers to service portable fire extinguishers without a portable fire extinguisher servicing company certificate. Any person that services portable fire extinguishers shall hold a certificate of fitness, except that a person training for such certificate of fitness may service portable fire extinguishers under the personal supervision of a certificate of fitness holder. Nothing in this section shall preclude portable fire extinguishers that are maintained on a premises for use at such premises from being serviced by the owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for portable fire extinguisher servicing and the tools, materials, equipment and facility necessary to perform such services.

**901.6.3.2 Portable fire extinguisher sales.** It shall be unlawful for any person to engage in the business of selling portable fire extinguishers door to door to owners of buildings or businesses for use on their premises without a portable fire extinguisher sales company certificate. Persons performing such services for or on behalf of licensed portable fire extinguisher sales companies shall possess a certificate of fitness for portable fire extinguisher sales.

**Exception:** Sale to owners of Group R-2 and R-3 occupancy buildings.

**901.6.3.3 Commercial cooking exhaust systems.** It shall be unlawful for any person engaged in the business of inspecting and cleaning commercial cooking exhaust systems as required by the provisions of this code to perform such service without a commercial cooking exhaust system servicing company certificate. The inspection and cleaning of commercial cooking exhaust systems required by FC904.11 shall be performed by a person holding a certificate of fitness. Nothing in this section shall preclude commercial cooking exhaust systems from being inspected and cleaned by the owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for inspecting and cleaning commercial cooking exhaust systems and the tools, materials, and equipment necessary to perform such services in accordance with this section.

**901.6.3.4 Smoke detector cleaning and testing.** The cleaning and testing for smoke entry and sensitivity of smoke detectors installed in a fire alarm system shall be performed by a person holding a certificate of fitness for smoke detector maintenance.

Such work shall be performed under the supervision and by employees of a person holding a smoke detector maintenance company certificate, except that such smoke detector cleaning and testing may be performed by an owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for smoke detector maintenance, and possesses the tools, instruments or other equipment necessary to perform such services in accordance this code and the rules. All other smoke detector maintenance shall be performed by a person possessing the requisite qualifications and experience, and any applicable license or certificate.

**901.6.3.5 Central station fire alarm monitoring.** It shall be unlawful for any person to operate a central station that monitors fire alarm systems and maintain transmitters in protected premises without a certificate of operation.

**901.7 Out-of-service systems.** The owner and the impairment coordinator for a standpipe system, sprinkler system or fire alarm system shall comply with the requirements of this section whenever such fire protection system is out of service. The department may direct that, until such fire protection system has been returned to service, fire safety measures appropriate to the size, configuration, occupancy, use and hazards be implemented that are in addition to or in lieu of those required by this section.

**901.7.1 Impairment coordinator.** The building owner shall designate an impairment coordinator to take the actions required by this section when a standpipe system, sprinkler system or fire alarm system is out of service. In the absence of a specific designee, the owner shall be considered the impairment coordinator.

**901.7.2 Fire watch.** Unless otherwise directed by the department, the building shall be evacuated or a fire watch maintained in accordance with this section when a standpipe system, sprinkler system or fire alarm system is out of service. Such fire watch shall be conducted in compliance with the requirements of FC 901.7.2.1 through 901.7.2.3.

**901.7.2.1 Duties and responsibilities.** Persons conducting a fire watch shall:

1. continuously patrol the area affected by the out-of-service fire protection system to which such person has been assigned, keeping constant watch for fires;
2. be provided with at least one approved means for notification of the department and any FLS director, FEP coordinator or FEP staff on the premises;
3. immediately report any fire to the department and notify emergency preparedness staff on the premises;
4. be trained in the use of portable fire extinguishers and equipped with a portable fire extinguisher, or made aware of the location of readily accessible portable fire extinguishers in the area to which such person has been assigned to maintain a fire watch;

5. be responsible for extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher;
6. maintain a record of such fire watch on the premises during the fire watch and for a minimum of 48 hours after the fire watch has concluded; and
7. have no other duties.

**901.7.2.2 Fire guards required.** The fire watch required when a standpipe system, sprinkler system or fire alarm system is out of service shall be maintained in accordance with FC901.7.2.2.1 and this section.

**Exception:** The impairment coordinator or other building staff trained and knowledgeable in conducting a fire watch may conduct a fire watch in lieu of a fire guard during the initial 4 hours of a planned removal from service, or after discovery of an unplanned out-of-service condition, provided that the floor or area in which the fire protection system is out of service does not exceed 50,000 square feet (4645 m<sup>2</sup>).

**901.7.2.2.1 Fire guards required.** The fire watch required for an out-of-service standpipe system, sprinkler system or fire alarm system shall be maintained by one or more fire guards.

**901.7.2.3 Fire watch coverage.** A sufficient number of fire guards shall be provided such that each floor or area in which the fire protection system is out of service is patrolled at least once an hour. The area to be patrolled by each fire guard shall not exceed more than 50,000 square feet (4645 m<sup>2</sup>) of floor area. The area patrolled by each fire guard may be further limited by the department depending on the configuration of the premises, impediments to patrol, nature of the occupancy, fire risk, and other fire safety considerations.

**901.7.3 Planned removal from service.** The impairment coordinator shall be made aware in advance of any planned removal from service of a standpipe system, sprinkler system or fire alarm system, or system component, for repair, servicing, alteration, testing and other maintenance of the system or component, or to allow construction to be performed in the area protected by the system without unnecessarily activating it. The impairment coordinator shall authorize and personally supervise the placing of the fire protection system out of service. Before authorizing the placing of the fire protection out of service the impairment coordinator shall:

1. notify the certificate of fitness holder responsible for supervising the maintenance of the standpipe system, sprinkler system or fire alarm system.
2. determine the extent and expected duration of the out-of-service condition.
3. inspect the areas or buildings involved and assess the increased risks.
4. make appropriate recommendations to the owner.

5. notify the department in accordance with FC901.7.5, if required.
6. notify the responsible person designated by the owner to issue hot work authorizations in accordance with FC Chapter 26.
7. notify the central station and insurance carrier.
8. notify the occupants in the affected areas if the duration of time the sprinkler system or fire alarm system will be out of service is estimated to be more than 30 minutes.
9. place a tag at each fire department connection, standpipe and sprinkler system control valve and fire command center, indicating which fire protection system, or part thereof, is out of service.
10. maintain the fire protection system in service until work is ready to begin.

**901.7.4 Unplanned out-of-service condition.** Any person, upon becoming aware of any condition, except a planned removal from service, rendering a standpipe system, sprinkler system or fire alarm system, or part thereof, inoperable in whole or in part, shall notify the owner and the impairment coordinator of such condition. The impairment coordinator shall take the actions set forth in FC901.7.3 and 901.7.5, and such other actions as are necessary or appropriate to protect the occupants of the building and promptly restore the system to service.

**901.7.5 Notification to department.** The department shall be notified that a standpipe system, sprinkler system or fire alarm system is out of service, whether by reason of a planned removal from service or an unplanned out-of-service condition, where required by FC 901.7.5.1 through 901.7.5.3.

**901.7.5.1 Standpipe systems.** Notification shall be made to the department whenever a standpipe system is or will be out of service for any period of time.

**901.7.5.2 Sprinkler systems and fire alarm systems.** Notification that a sprinkler system or fire alarm system, or any part thereof, is or will be out of service shall be made to the department under the following circumstances:

1. The sprinkler system or fire alarm system is or will be out of service on more than one floor of a building; or
2. With respect to a sprinkler system, the work or repairs cannot be completed, and the system restored to service, within 8 hours of the time the system was placed or went out of service; or
3. With respect to a fire alarm system, the work or repairs will require the fire alarm system to be out of service for more than 8 hours in any 24-hour period; or

4. One or more other fire protection systems in the area in which a fire protection system is out of service are or will also be out of service at the same time.

**901.7.5.3 Reporting requirements.** Notification of an out-of-service condition pursuant to this section shall be made by the impairment coordinator to the Department at the applicable telephone number set forth in FC401.2.2. Such notification shall include the following information:

1. The owner or impairment coordinator's name and contact information;
2. The building address;
3. The type of fire protection system that is out of service;
4. Whether the fire protection system is out of service by reason of a planned removal from service (and if so, the reason for placing it out of service) or an unplanned out-of-service condition;
5. If a planned removal from service, the date and time the fire protection system will be placed out of service, and the estimated duration the system will be out of service;
6. If an unplanned out-of-service condition, the estimated duration the system will be out of service;
7. The floors or areas in which the fire protection system is out of service;
8. Whether the other fire protection systems are in good working order; and
9. The name and certificate number of the certificate of fitness holder responsible for supervision of the fire protection system that is out of service.

**901.7.6 Restoring systems to service.** When an out-of-service device, equipment or system is restored to service, the impairment coordinator shall:

1. conduct necessary inspections and tests to verify that the affected systems are operational.
2. notify the department.
3. notify the owner, central station, insurance carrier, emergency preparedness staff, and, if previously notified, the occupants in the affected areas.
4. remove the out-of-service tags.



**901.7.7 Out-of-service standpipe systems at construction sites.** The owner, fire safety manager and/or impairment coordinator shall take the following actions whenever a standpipe system at a construction site is out of service:

1. Immediately notify the department of any unplanned out-of-service condition, and otherwise comply with the requirements of FC901.7.4.
2. Notify the department at least 24 hours prior to any planned removal of the standpipe system from service, and otherwise comply with the requirements of FC901.7.3.
3. Ensure that a fire watch is continuously maintained in compliance with the requirements of FC901.7.2 while the standpipe system is out of service.
4. Repair the standpipe system and return it to service in compliance with the requirements of FC 901.7.6 and Section 3303.8.1 of the Building Code. The construction site may continue to be occupied, and construction, demolition or alteration activities may continue, pending such repair and restoration to service, except:
  - 4.1. as otherwise provided in Section 3303.8.1 of the Building Code; and/or
  - 4.2. as otherwise directed by the commissioner upon a determination that, in the absence of an operable standpipe system, the conduct of certain construction, demolition or alteration activities would be imminently perilous to life or property; and
  - 4.3. that in no circumstance shall hot work be conducted on the construction site until such time as the standpipe system is restored to service and the standpipe alarm reactivated.

**901.8 Tampering with or rendering equipment inoperable.** Fire protection systems and related apparatus shall not be tampered with or rendered inoperable, except as set forth in FC107.4.

**901.9 Recall of fire protection system components.** A component of a fire protection system regulated by this code that is subject to a voluntary or mandatory recall under federal law shall be replaced with an approved, listed component in compliance with the referenced standards. A record of the replacement of the component shall be maintained in accordance with FC107.7.

## **SECTION FC 902 DEFINITIONS**

**902.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ALARM NOTIFICATION APPLIANCE.** A fire alarm system component, such as a bell, horn, speaker, light, text display or vibration device that issues an audible, tactile, and/or visual alert.

**ALARM SIGNAL.** A signal indicating an emergency requiring immediate action, such as a signal indicative of fire.

**ANNUNCIATOR.** A unit containing one or more indicator lamps, alphanumeric displays, or other equivalent means in which each indication provides status information about a circuit, condition or location.

**AUTOMATIC.** As applied to fire protection devices, any device, equipment or system that initiates system function as a result of a predetermined temperature rise, rate of temperature rise, or combustion products, without the necessity for human intervention.

**CENTRAL STATION.** A facility that receives alarm signals from a protected premises and retransmits or otherwise reports such alarm signals to the department.

**CERTIFICATE OF OPERATION.** A written statement issued by the commissioner approving the operation of a central station, for which such certificate is required by this code or the rules, or the construction codes.

**CLEAN AGENT.** Electrically nonconducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.

**COMMERCIAL COOKING EXHAUST SYSTEM SERVICING COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of inspecting and cleaning commercial cooking equipment exhaust systems, which authorizes such person to inspect and clean commercial cooking equipment exhaust systems, for which such certificate is required by this code or the rules.

**COMMERCIAL COOKING SYSTEM.** A system consisting of commercial cooking equipment, exhaust hood, filters, exhaust duct system, fire extinguishing system and other related appurtenances designed to capture grease-laden cooking vapors.

**EMERGENCY ALARM SYSTEM.** A system to provide indication and warning of an emergency condition involving a release of hazardous materials or other hazardous material incident.

**FIRE ALARM BOX, MANUAL.** A manually operated device used to initiate an alarm signal.

**FIRE ALARM SIGNAL.** A signal initiated by a fire alarm-initiating device such as a manual fire alarm box, automatic fire detector, water-flow switch, or other device whose activation is indicative of the presence of a fire or fire signature.

**FIRE ALARM SYSTEM.** Any system, including any interconnected fire alarm sub-system, of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices.

**FIRE DETECTOR, AUTOMATIC.** A device designed to detect the presence of a fire signature and to initiate action.

**FIRE EXTINGUISHING SYSTEM.** An approved system of devices and equipment which detects a fire and discharges an approved fire extinguishing agent onto or in the area of a fire. Such term includes automatic systems and, where such systems are authorized by this code or the Building Code, manually activated systems.

**FIRE PROTECTION SYSTEM.** Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof, including fire extinguishing systems, fire alarm systems, sprinkler systems and standpipe systems.

**IMPAIRMENT COORDINATOR.** The person responsible for ensuring that proper safety precautions are taken when a fire protection system is out of service.

**INITIATING DEVICE.** A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box, or supervisory switch.

**MULTIPLE-STATION ALARM DEVICE.** Two or more single-station alarm devices that can be interconnected such that actuation of one causes all integral or separate audible alarms to operate. It also can consist of one single-station alarm device having connections to other detectors or to a manual fire alarm box.

**OUT-OF-SERVICE SYSTEM.** A fire protection system that is not fully functional; or whose operation is impaired or is otherwise not in good working order.

**PORTABLE COOKING EQUIPMENT.** Commercial cooking equipment, provided with or installed with wheels.

**PORTABLE FIRE EXTINGUISHER SALES COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of selling portable fire extinguishers door to door to owners of buildings or business for use on their premises, which authorizes such person to engage in such business and supervise such sales.

**PORTABLE FIRE EXTINGUISHER SERVICING COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of servicing portable fire extinguishers, which authorizes such person to engage in such business and supervise the provision of such servicing by certificate of fitness holders.

**PRESIGNAL SYSTEM.** A fire alarm system having a feature that allows initial fire alarm signals to sound in a constantly attended central location and for which a human action is

subsequently required to achieve a general alarm, or a feature that allows the control equipment to delay the general alarm by more than one minute after the start of the alarm processing.

**PROTECTED PREMISES.** A building, occupancy or structure located in the city that is equipped with a fire alarm system that transmits an alarm signal to the department or a central station that monitors such system for the purposes of reporting fire alarms to the department, whether or not the installation of such system on the premises is required by law.

**SINGLE-STATION SMOKE ALARM.** An assembly incorporating the detector, the control equipment, and the alarm-sounding device in one unit, operated from a power supply either in the unit or obtained at the point of installation.

**SMOKE ALARM.** A single- or multiple-station alarm responsive to smoke and not connected to a system.

**SMOKE DETECTOR.** A listed device that senses visible or invisible particles of combustion.

**SMOKE DETECTOR MAINTENANCE COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of performing smoke detector cleaning and testing, which authorizes such person to engage in such business and supervise the performance of such cleaning and testing by certificate of fitness holders.

**SPRINKLER SYSTEM.** A fire extinguishing system, other than a mist fire extinguishing system, that utilizes water as the extinguishing agent.

**STANDPIPE, MULTI-ZONE.** A standpipe system that is vertically subdivided as required by the construction codes, including the Building Code, into zones to limit the maximum operating pressure in the system. Each zone will have its own individual automatic water supply.

**STANDPIPE SYSTEM.** Piping installed in a building or structure that serves to transfer water from a water supply to hose connections at one or more locations in a building or structure used for firefighting purposes.

**SUPERVISORY SIGNAL.** A signal indicating the need for action in connection with the supervision of guard tours, fire extinguishing systems or equipment, fire alarm systems or the maintenance features of related systems.

**SUPERVISORY SIGNAL-INITIATING DEVICE.** An initiating device, such as a valve supervisory switch, water level indicator, or low-air pressure switch on a dry-pipe sprinkler system, that triggers a supervisory signal.

**TROUBLE SIGNAL.** A signal initiated by the fire alarm system or device indicative of a fault in a monitored circuit or component.

**UNNECESSARY ALARM.** An alarm signal transmitted by a fire alarm system which functioned as designed, but for which a department response proved unnecessary. An example of

an unnecessary alarm is an alarm triggered by smoke from a lit cigarette in a non-smoking area, when the presence of such smoke does not implicate fire safety concerns.

**UNWARRANTED ALARM.** An alarm signal transmitted by a fire alarm system which failed to function as designed as a result of improper installation, improper maintenance, malfunction, or other factor. Examples of unwarranted alarms are alarms resulting from improper smoke detector placement, improper detector setting for installed location, lack of system maintenance, and control panel malfunction.

## SECTION FC 903 SPRINKLER SYSTEMS

**903.1 General.** Sprinkler systems shall comply with the requirements of this section.

**903.2 Where required.** Sprinkler systems shall be provided in buildings, structures, premises, or parts thereof, when required by the construction codes, including the Building Code, this code or the rules.

**903.2.1 through and including 903.2.10** Reserved.

**903.2.11 During construction.** Sprinkler systems required during construction, alteration and demolition operations shall be provided in accordance with Chapter 33 of the Building Code and FC1414.

**903.2.12** Reserved.

**903.2.13 Other required fire extinguishing systems.** In addition to the requirements of FC903.2, the provisions indicated in FC Table 903.2.13 also require the installation of a fire extinguishing system for certain buildings and areas.

**FC TABLE 903.2.13 ADDITIONAL REQUIRED FIRE EXTINGUISHING SYSTEMS**

SECTION	SUBJECT
1208.2	Dry cleaning facilities
1208.3	Dry cleaning machines
1504.3.3.1	Spray rooms
1504.3.3.2	Spray booths
1505.2	Dip-tank rooms
1505.3.4.2	Dip tanks
1505.4.4	Hardening and tempering tanks
1803.10	HPM facilities
1803.10.1.1	HPM work station exhaust
1803.10.2	HPM gas cabinets
1803.10.3	HPM corridors
1803.10.4	HPM exhaust
1803.10.4.1	HPM noncombustible ducts
1803.10.4.2	HPM combustible ducts
2106.1	Class A and B furnaces
2106.2	Class C and D furnaces
2206.8	Flammable liquid motor fuel-dispensing areas
2208.7.4	Indoor CNG compressing, storage and dispensing areas
2209.3.4.2	Hydrogen motor fuel-dispensing areas under canopies
FC Table 2306.2	High-piled storage fire protection

2306.4	High-piled storage
2703.8.4.1	Gas rooms
2703.8.5.3	Exhausted enclosures
2704.5	Indoor storage of hazardous materials
2705.1.8	Indoor handling and use of hazardous materials
2804.4.1	Aerosol warehouses
2904.5	Storage of more than 1,000 cubic feet of loose combustible fibers
3306.7	Storage of small arm ammunition, powder-actuated tool loads, black powder or smokeless propellant
3404.3.7.5.1	Flammable and combustible liquid storage rooms
3404.3.8.4	Flammable and combustible liquid storage warehouses
3405.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
3704.1.2.2	Gas cabinets for highly toxic and toxic gas
3704.1.3.1	Exhausted enclosures for highly toxic and toxic gas
3704.2.2.6	Gas rooms for highly toxic and toxic gas
3704.3.3	Outdoor storage for highly toxic and toxic gas
4204.1.1	Pyroxylin plastic storage cabinets and vaults
4204.1.3	Pyroxylin plastic storage vaults
4204.2	Pyroxylin plastic storage, handling and use
Building Code	Sprinkler requirements as set forth in the construction codes, including the Building Code

For SI: 1 cubic foot = 0.023 m<sup>3</sup>.

**903.3 Installation requirements.** Except as otherwise provided in this code, sprinkler systems shall be designed and installed in accordance with the construction codes, including the Building Code.

**903.4 Sprinkler system supervision and alarms.** All valves controlling the water supply for sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electrically supervised by the fire alarm system where a fire alarm system is required by Section 907 of the Building Code.

**Exceptions:**

1. Sprinkler systems protecting Group R-3 occupancies.
2. Reserved.
3. Sprinkler systems installed in accordance with NFPA 13R, as modified by FC Appendix B, where a common supply main is used to supply both domestic water and the sprinkler system, and a separate shutoff valve for the sprinkler system is not provided, except where the Building Code requires such sprinkler system to be supervised.
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.

**903.5 Maintenance.** Sprinkler systems shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and the rules. Except as otherwise provided in FC 903.5.1 through 903.5.3, sprinkler systems shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person holding a certificate of fitness, employed by the owner, to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. A detailed record of each inspection shall be kept for examination by any representative of the department.
2. There shall be one or more employees instructed in the maintenance of sprinkler systems.
3. There shall be kept available at all times in the premises a supply of at least six extra sprinkler heads to replace promptly any fused or damaged sprinklers.
4. Fire department connections shall be hydrostatically tested at least once every 5 years, in accordance with FC912.6.

**903.5.1 Sprinkler systems in converted dwellings and single room occupancies.** In any converted dwelling or tenement used in whole or in part for single room occupancy, regardless of occupancy classification, in which a sprinkler system has been installed pursuant to the requirements of the Multiple Dwelling Law, such sprinkler system shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person employed by the owner, holding a certificate of fitness issued by the department, a fire suppression contractor license issued by the Department of Buildings, or, for a sprinkler system with not more than thirty sprinkler heads, a plumber, to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. Such inspection shall include a check of all control valves on the system, including the main supply control valve, making certain the valves are fully open and sealed in such open position; a check of the static pressure in the sprinkler system from a pressure gauge, if installed, located at or near the inspector's test connection, making certain the system design pressure is being maintained; a check that all sprinkler heads are in place; and such other requirements as the commissioner may prescribe. A detailed record of each inspection shall be kept for examination by any representative of the department.
2. There shall be one or more employees instructed in the location and status of the sprinkler system control valves.
3. There shall be kept available at all times in the premises a supply of at least six extra sprinkler heads, to replace promptly any fused or damaged sprinklers, except that a

supply of at least three extra sprinkler heads shall be kept available for any sprinkler system installed in accordance with NFPA 13R, as modified by FC Appendix B.

4. Fire department connections shall be hydrostatically tested at least once every 5 years in accordance with FC912.6.
5. Upon order of the commissioner, but at least once every year, a flow test of the sprinkler system shall be conducted. Such test shall be conducted at the owner's risk by his or her representative, who shall be a licensed master plumber or licensed master fire suppression contractor. At least one such flow test shall be conducted before a representative of the department at least once every 5 years. A report of each test, on an approved form, shall be certified by such licensed master plumber or licensed master fire suppression contractor and shall be kept for not less than 5 years and made available for inspection by any representative of the department.
6. The owner or managing agent of any building subject to the requirements of this section shall maintain a record of each inspection and test and a listing of all outstanding violations issued pursuant to this section. Such records and listing shall be made available for inspection by occupants of such residential buildings during regular business hours.

**903.5.2 Sprinkler systems in other R-2 occupancies.** Except as otherwise provided in FC903.5.1, in Group R-2 occupancies, sprinkler system shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person employed by the owner, holding a certificate of fitness issued by the department, a fire suppression contractor license issued by the Department of Buildings, or, for a sprinkler system with not more than thirty sprinkler heads, a plumber, to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. Such inspection shall include a check of all control valves on the system, including the main supply control valve, making certain the valves are fully open and sealed in such open position; a check of the static pressure in the sprinkler system from a pressure gauge, if installed, located at or near the inspector's test connection, making certain the system design pressure is being maintained; a check that all sprinkler heads are in place; and such other requirements as the commissioner may prescribe. A detailed record of each inspection shall be kept for examination by any representative of the department.
2. There shall be one or more employees instructed in the location and status of the sprinkler system control valves.
3. There shall be kept available at all times in the premises a supply of at least six extra sprinkler heads, to replace promptly any fused or damaged sprinklers, except that a supply of at least three extra sprinkler heads shall be kept available for any sprinkler system installed in accordance with NFPA 13R, as modified by FC Appendix B.



4. Fire department connections shall be hydrostatically tested at least once every 5 years in accordance with FC912.6.
5. Upon order of the commissioner, but at least once every year, a flow test of the sprinkler system shall be conducted; provided, however, that where there is a pressure gauge installed at or near the inspector's test location that is checked during the required monthly inspection described in FC903.5.2(1) to make certain the system design pressure is being maintained, a flow test of the sprinkler system shall be conducted upon order of the commissioner, but at least once every 30 months. Such test shall be conducted at the owner's risk by his or her representative, who shall be a plumber or licensed master fire suppression contractor. At least one such test shall be conducted before a representative of the department at least once every 5 years. A report of each test, on a form prepared by the department, shall be certified by such plumber or licensed master fire suppression contractor and shall be kept for not less than 5 years and made available for inspection by any representative of the department.
6. The owner or managing agent of any building subject to the requirements of this section shall maintain a record of each inspection and test and a listing of all outstanding violations issued pursuant to this section. Such records and listing shall be made available for inspection by occupants of such residential buildings during regular business hours.

**903.5.3 Sprinkler systems in Group R-3 occupancies.** Sprinkler systems in buildings classified in Group R-3 occupancies shall be maintained in perfect working order.

**903.5.4 Sprinkler system control valve signage.** A sign identifying the location of the sidewalk box housing the sprinkler system control valve shall be conspicuously posted on the exterior wall of the building directly opposite the sidewalk box. Such sign shall have red letters 1 inch (25 mm) in height on a white background and read: "Sprinkler System Shutoff Valve (*indicate distance*) Feet Opposite This Sign" or other approved design.

**903.6 Dry pipe sprinkler system valves.** In addition to the maintenance requirements set forth in FC903.5, any dry pipe valve installed in a sprinkler system shall be trip tested at least once every 5 years and whenever the system is altered. Such trip test shall be conducted at the owner's risk, with the control valve fully open and the quick-opening device, if provided, in service, by a master fire suppression contractor licensed by the Department of Buildings before a representative of the department.

## **SECTION FC 904 FIRE EXTINGUISHING SYSTEMS**

**904.1 General.** Fire extinguishing systems shall be designed, installed, operated and maintained in accordance with this section, FC901 and the applicable referenced standards, including performing all required inspections, testing and servicing.

**904.1.1 Installation acceptance testing.** Fire extinguishing systems shall be subject to acceptance tests as contained in the installation standards set forth in this code and the rules.

When a discharge test is not required by the installation standard, the commissioner may require such test when there is evidence that the system will not provide the necessary level of protection. Such tests shall be conducted at the owner's risk by his or her representative before a representative of the department.

**904.1.2 Additional safeguards.** If an area is protected by a fire extinguishing system which uses an extinguishing agent that will make the protected area hazardous by its discharge or thermal decomposition, suitable safeguards shall be provided to ensure prompt evacuation, to prevent entry into such atmospheres, and to provide means for prompt rescue of any trapped personnel. Such safeguards shall include establishment of a trained brigade, equipped with and qualified in the use of self-contained breathing apparatus with 30-minute minimum supply, for prompt search of the protected area.

**Exception:** Self-contained breathing apparatus shall not be required for a clean agent fire extinguishing system installation if:

1. The installation is provided with an alarm system that is connected to an approved central station.
2. The protected area is provided with an approved fixed emergency forced ventilation system able to expel the extinguishing agent. Such emergency forced ventilation system shall have a capacity sufficient to effect at least twenty air changes per hour.
3. The protected area is of a size, design and/or occupied in such a manner that egress will not be impeded.
4. The protected area is not normally occupied by any individual requiring assistance in evacuation.

**904.2 Where required.** Where this code or the rules requires the installation of a fire extinguishing system, other than a sprinkler system, the commissioner shall approve the type of fire extinguishing system to be installed. Fire extinguishing systems installed as an alternative to sprinkler systems otherwise required by this code or the construction codes, including the Building Code, shall be approved by the commissioner. Such a system may be accepted by the commissioner where the nature of the fire hazard is such that water would be ineffective or hazardous as an extinguishing agent, or the need to preserve the historic, irreplaceable or special nature of the contents of the occupancy militates against the installation of a sprinkler system. Sprinklers shall not be omitted from any room or area merely because it is of fire-resistance-rated construction or contains electrical equipment.

If a system using a fixed amount of extinguishing agent is authorized to be installed in lieu of a required sprinkler system or any other fire extinguishing system otherwise required by law, a connected reserve of charged agent cylinders equal to the primary supply shall be provided. The commissioner may impose additional requirements on the installation of any fire extinguishing system to be installed in lieu of any required sprinkler system. Fire extinguishing systems shall

not be considered alternatives for the purposes of exceptions or reductions allowed by other requirements of this code.

**904.3 Installation.** Fire extinguishing systems shall be installed in accordance with this section.

**904.3.1 Electrical wiring.** Electrical wiring shall be in accordance with the Electrical Code.

**904.3.2 Actuation.** Fire extinguishing systems shall be provided with a manual means of actuation.

**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 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.

**904.3.5 Monitoring.** Where a building fire alarm system is installed, fire extinguishing systems shall be monitored by such fire alarm system.

**904.3.6 Flood hazard.** Non-water fire extinguishing system control panels located in areas of special flood hazard or on the premises of Group I-2 occupancies that are hospitals located in shaded X-Zones (as defined in Section G201.2 of Appendix G of the Building Code) shall be located at or above the design flood elevation in accordance with Appendix G of the Building Code.

**904.4 Installation acceptance inspection and testing.** Fire extinguishing systems shall be inspected and tested in accordance with this section prior to the installation acceptance testing required by FC904.1.1.

**904.4.1 Inspection.** Prior to conducting final acceptance tests, 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 an approved central station shall be tested in accordance with this section and FC907 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 central stations shall be tested to verify proper identification and retransmission of alarms from fire extinguishing systems.

**904.5 Wet chemical systems.** Wet chemical fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 17A, as modified by FC Appendix B, and their listing.

**904.5.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be weighed to verify the required amount of agent. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified by the manufacturer.

**904.5.2 Fusible link maintenance.** Fixed temperature- sensing elements shall be maintained to ensure proper operation of the system.

**904.5.3 Commercial cooking installations.** Wet chemical fire extinguishing systems installed to protect a commercial cooking operation shall additionally comply with the requirements of FC904.11.

**904.6 Dry chemical systems.** Dry chemical fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 17, as modified by FC Appendix B, and their listing.

**904.6.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess that the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests

shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be checked to verify that the system has not been discharged. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified 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 fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 11, as modified by FC Appendix B, and NFPA 16, as modified by FC Appendix B, and their listing.

**904.7.1 Maintenance.** At least once a month, an inspection shall be conducted by a certificate of fitness holder to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system, shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

**904.7.2 Commercial cooking installations.** Foam fire extinguishing systems installed to protect a commercial cooking operation shall additionally comply with the requirements of FC904.11.

**904.8 Carbon dioxide systems.** Carbon dioxide fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 12, as modified by FC Appendix B, and their listing. Total flooding carbon dioxide fire extinguishing systems shall not be installed to protect hazards within normally occupied areas. Existing total flooding carbon dioxide fire extinguishing systems installed to protect normally occupied areas prior to the effective date of this code may be continued in service until July 1, 2013, after which they shall be removed from service, and a replacement fire extinguishing system shall be installed, where required, in accordance with the Building Code, this code or other applicable laws, rules and regulations.

**904.8.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

**904.8.2 High-pressure cylinders.** High-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at 6-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.

**904.8.6 Safety precautions.** All areas whose atmospheres will be made hazardous by the discharge of carbon dioxide shall be provided with:

1. Exit and exit routes that are kept clear at all times.
2. Lighting and exit directional signs in accordance with the construction codes, including the Building Code.
3. Only outward swinging, self-closing doors at exits, and panic hardware on any such doors that are secured with a locking or latching device.
4. A fixed emergency forced ventilation system able to clear the area. Such emergency forced ventilation shall have sufficient capacity to accomplish at least 6 air changes per hour.
5. Such other safety equipment as may be prescribed by the commissioner.

**904.8.7 Detection, activation, alarm and control.** Detection, pre-discharge alarms and discharge alarms shall be provided within and outside the protected area and such other areas that are made hazardous by a carbon dioxide discharge. Such alarms shall be audible and visible.

**904.8.7.1 Automatic operation.** The carbon dioxide fire extinguishing system shall be activated by an automatic cross-zoned detection system in which activation of a detection device in one zone shall sound a local alarm and transmit an alarm to an approved central station, and activation of a detection device in the cross zone shall initiate the pre-discharge warning signal and after a time delay, initiate the discharge of carbon dioxide. The pre-discharge warning signal time delay shall be of sufficient duration to allow for evacuation from the protected area. Distinct alarms shall indicate the activation of a detector in one zone, the activation of a detector in a cross zone (pre-discharge alarm) and the discharge of carbon dioxide. Such alarms shall be continued until the atmosphere has been returned to normal except that the alarm for the detector in one zone may be discontinued when the alarm for the cross-zone detector is activated.

### **Exceptions:**

1. A carbon dioxide fire extinguishing system activated solely by manual means may be installed only if approved. Such a system may be approved upon a showing satisfactory to the commissioner of the need for such a system.
2. A detection system that is not cross-zoned may be approved upon a showing satisfactory to the commissioner of the need for such a detection and activation system.

**904.8.7.2 Manual operation.** A manual pull station shall be provided which, upon activation, transmits an alarm to an approved central station, overrides any delay other than the pre-discharge delay, and causes the carbon dioxide to discharge. Activation of a carbon dioxide fire extinguishing system by means of a manual pull station shall result in a complete pre-discharge delay sequence prior to system discharge.

**904.8.7.3 Abort systems.** Abort systems may be installed, but shall be limited to systems activated by smoke detectors. Abort controls shall be located in the protected area near the means of egress for the area, and shall be designed to cause the discharge of carbon dioxide after a time delay unless the abort control is reactivated for another cycle of delay. Abort controls shall not interfere with transmission of local alarms or central station alarms.

**904.8.7.4 Power supply.** Power supply to the alarm system shall be in accordance with applicable requirements of the construction codes, including the Building Code and the Electrical Code.

**904.8.8 Pressure relief venting.** The protected area enclosure shall be provided with suitable pressure relief venting which vents outdoors.

**Exception:** Such venting shall not be required when a registered design professional certifies that the walls, ceilings and floors comprising the protected space have sufficient porosity and leakage to prevent damage to the integrity of such space upon discharge of the extinguishing agent, and that the inert gas agent leakage into other non-flooded rooms and spaces will not reach dangerous concentrations.

**904.8.9 Commercial cooking installations.** Carbon dioxide fire extinguishing systems installed to protect commercial cooking operations shall additionally comply with the requirements of FC904.11.

**904.9 Halon systems.** It shall be unlawful to install a halon fire extinguishing system. Existing halon fire extinguishing systems shall be periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 12A and their listing.

**904.9.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed

master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

**904.9.2 Containers.** The extinguishing agent quantity and pressure of containers shall be checked at least on a semiannual basis. 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 5-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, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 2001, as modified by FC Appendix B, and their listing. The use of a clean agent fire extinguishing system shall be limited to automatic total flooding systems.

**904.10.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

**904.10.2 Containers.** The extinguishing agent quantity and pressure of the containers shall be checked at 6-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 5-year intervals.



**904.10.4 System alarm and activation.** Audible and visible alarms shall be installed both inside and outside the protected area to signal the activation of an automatic detection device and the operation of the fire extinguishing system. Such signals shall continue until the atmosphere has been returned to normal. Activation of a single automatic detection device shall sound a local alarm and transmit an alarm to an approved central station. Unless the alarm is cancelled by an abort system as set forth in FC904.10.5, activation of a second automatic detection device shall, within 30 seconds, initiate the discharge of clean agent. Power supply to the alarm system shall be in accordance with the construction codes, including the Building Code, the Electrical Code and NFPA 2001, as modified by FC Appendix B.

**904.10.4.1 Warning and instruction signs.** Warning and instruction signs shall be posted at entrances to and within the protected area subject to flooding.

**904.10.5 Abort systems.** Abort systems may be installed only on systems activated by smoke detectors. Abort controls shall be manually operated, shall be located in the protected area, and shall cause the dumping of the clean agent after a 2-minute delay unless the abort control is reactivated for another cycle of delay. A manual pull station shall be provided which, upon activation, shall transmit an alarm to an approved central station, override the delay and cause the clean agent to dump immediately. Abort controls shall not interfere with transmission of local alarms or central station alarms.

**904.10.6 Means of egress.** Where the protected area is normally occupied, provision shall be made for adequate clear routes of exit with doors opening in direction of travel. Emergency lighting shall be provided for such exits. Exit directional signs shall clearly indicate the path of egress.

**904.10.7 Fixed emergency forced ventilation.** When the protected area is normally occupied, a fixed emergency forced ventilation system sufficient to accomplish at least six air changes per hour of the flooded protected area shall be provided unless all of the following apply:

1. The clean agent fire extinguishing system is used to extinguish a Class A fire.
2. The design concentration does not exceed the “no observable adverse effect level” for halocarbon agents, or “no effect level” for inert gas agents as defined in NFPA 2001, as modified by FC Appendix B.
3. If other than inert gas agents are used, the quantity of the thermal decomposition products formed from such agents is below the dangerous toxic load (DTL) for humans as described in Meldrum's “Toxicology of Substances in Relation to Major Hazards: Hydrogen Fluoride” (HMSO, London, 1993). Upon request, documentation of hazard assessment of thermal decomposition products formed from such agents shall be filed with the department.

**904.10.8 Pressure relief venting.** Clean agent fire extinguishing systems using inert gas agents shall be provided with suitable pressure relief venting for the flooded protected area that discharges outdoors.

**Exception:** Such venting shall not be required when a registered design professional certifies that the walls, ceilings and floors comprising the protected space have sufficient porosity and leakage to prevent damage to the integrity of such space upon discharge of the extinguishing agent, and that the inert gas agent leakage into other non-flooded rooms and spaces will not reach dangerous concentrations.

**904.11 Commercial cooking systems.** The fire extinguishing system for commercial cooking systems shall be designed and installed, and periodically inspected, tested and otherwise maintained in accordance with the construction codes, including the Building Code, FC 901, 904.1.1 and 904.4, and this section. The fire extinguishing system for commercial cooking systems shall be of an approved type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered wet chemical fire extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Dry chemical fire extinguishing systems shall not be installed to protect commercial cooking equipment and exhaust systems. Other types of 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, its listing and the manufacturer's installation instructions. Fire extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide fire extinguishing systems, NFPA 12, as modified by FC Appendix B.
2. Foam-water sprinkler system or foam-water spray systems, NFPA 16, as modified by FC Appendix B.
3. Wet chemical fire extinguishing systems, NFPA 17A, as modified by FC Appendix B.

**904.11.1 Manual system operation.** A manual activation device shall be located at or near a means of egress from the cooking area and a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual activation device shall be located a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) above the floor at its center. The manual activation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to activate the fire extinguishing system. A sign or marking on or adjacent to the manual activation device shall clearly identify the commercial cooking equipment being protected.

**Exception:** Sprinkler systems shall not be required to be equipped with a manual activation device.

**904.11.2 System interconnection.** The activation of the fire extinguishing system shall automatically shut down the fuel and electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

### 904.11.3 Reserved.

**904.11.4 Acceptance testing.** Upon completion of the installation of a commercial cooking system, such system shall be tested at the owner's risk, by his or her representative, to confirm proper installation and operation of the system in compliance with the requirements of the construction codes, including the Mechanical Code, and this code. The owner's representative shall furnish the necessary equipment required to conduct the test. No permit shall be issued for the operation of a commercial cooking system until satisfactory performance of the fire extinguishing system is demonstrated, including compliance with the following requirements:

1. A performance test of the fire extinguishing system conducted before a representative of the department, in accordance with the applicable installation standard set forth in this chapter and its listing.
2. Chimneys serving masonry ovens shall be proved tight by a smoke test. A report of such test shall be prepared by the installer and made available for inspection by a representative of the department at the time the performance tests of the exhaust system and fire extinguishing system are witnessed by such department representative.

**904.11.5 Staff training.** At least once every 6 months the owner or operator of the premises shall review with all kitchen staff the manual operation of the fire extinguishing system.

**904.11.6 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess that the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. At a minimum, the semiannual inspection, testing and servicing shall include:

1. Verification that the hazard has not changed.
2. Verification that the fire extinguishing system has not been altered.
3. Examination of all detectors, agent and gas containers, releasing devices, piping, hose assemblies, nozzles, and all auxiliary equipment.
4. Verification that the agent distribution piping is not obstructed.
5. Verification that the extinguishing agent container and/or auxiliary pressure containers have been, as applicable, inspected, retested and marked in conformance with the requirements of the United States Department of Transportation.
6. A test of the system's automatic and manual releasing devices, including any associated equipment.

7. A test of the gas and electric power source shutoff devices.
8. Preparation and submission to the owner of a written report of any system defects.
9. Upon satisfactory completion of the semiannual inspection and correction of all defects, providing the owner with an inspection, testing and service compliance tag. Such tag shall indicate the date issued, the name and license number of the licensed master fire suppression piping contractor issuing the tag, and that the system was found to be in compliance with the requirements of this section.

**904.11.6.1 Fusible link and sprinkler head replacement.** Fusible links and foam water sprinkler heads shall be replaced at least 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.

**904.11.6.2 Recordkeeping.** Records shall be maintained as set forth in FC901.6.2. Upon satisfactory completion of each semiannual inspection required by FC904.11.6, and the correction of all system defects, the master fire suppression piping contractor licensed by the Department of Buildings shall issue and post in a conspicuous location in the cooking area an inspection, testing and servicing compliance tag. A new compliance tag shall be issued and posted for each required semiannual inspection.

**904.11.6.3 Signage.** Instructions for manual operation of the fire extinguishing system, including a statement that the fire extinguishing system shall be manually activated prior to using a portable fire extinguisher, shall be posted, under glass or laminated, near the system's manual activation device. Information shall be clearly and concisely written, and the posting shall be at least 8½ inches (216 mm) by 11 inches (279 mm) in size.

**904.12 Water-mist systems.** Water-mist fire extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with FC 901 and 904.4, NFPA 750, as modified by FC Appendix B, and their listing. All devices and appurtenances shall be listed and installed in conformance to the terms of the listing.

**904.12.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

**904.13 Aerosol fire extinguishing systems.** Aerosol fire extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with FC 901 and 904.4, NFPA 2010, as modified by FC Appendix B, and their listing. All devices and appurtenances shall be listed and installed in conformance to the terms of the listing.

**904.13.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

## **SECTION FC 905 STANDPIPE SYSTEMS**

**905.1 General.** Standpipe systems shall be provided where required by the construction codes, including the Building Code, this code or the rules. Fire hose threads used in connection with standpipe systems shall be approved by the commissioner. The location of fire department hose connections shall be approved by the commissioner. Standpipe systems in buildings used for high-piled combustible storage shall be in accordance with FC Chapter 23.

**905.1.1 Standpipe system operator.** In buildings with a multi-zone standpipe system, such system shall be continuously under the personal supervision of a person holding a certificate of fitness, who shall be immediately available to assist the department in the operation of such system.

**905.2 Installation standards.** Standpipe systems shall be installed in accordance with the construction codes, including the Building Code.

**905.3 through and including 905.6** Reserved.

**905.7 Cabinets.** Cabinets containing firefighting equipment, such as standpipes, fire hose, portable fire extinguishers and water supply control valves, shall not be obstructed from use or obscured from view.

**905.8** Reserved.

**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 central station required by FC903.4. Where a fire alarm system is provided, a signal shall also be transmitted to the fire alarm system control panel.

### **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, alteration and demolition operations shall be provided in accordance with Chapter 33 of the Building Code and FC1413.

**905.11** Reserved.

**905.12 Maintenance.** Standpipe systems shall be maintained, including all required inspection, testing and servicing, in accordance with this section, FC901.6 and NFPA 25.

**905.12.1 Standpipe hydrostatic pressure and flow tests.** Upon order of the commissioner, but at least once every 5 years, the standpipe system shall be subjected to a hydrostatic pressure test and a flow test to demonstrate its suitability for department use. These tests shall be conducted in compliance with the requirements of the rules and shall be conducted at the owner's risk, by his or her representative before a representative of the department.

## SECTION FC 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 adult homes and enriched housing, and S occupancies.
2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or combustible liquids are manufactured, stored, handled and used, including dispensing, in quantities requiring a permit pursuant to FC105.6.
4. On each floor of structures under construction, alteration or demolition, except detached Group R-3 occupancies, in accordance with FC1415.1.
5. Where required by the sections indicated in FC Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the commissioner.
7. Where required by other provisions of this code or the rules.

**FC TABLE 906.1  
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS**

SECTION	SUBJECT
303.5	Tar kettles and asphalt melters
307.4	Open fires
307.5	Portable outdoor barbecues
308.3.1.5	Flaming food and beverages in Group A occupancies
309.4	Powered industrial trucks
315.3.4	Outdoor storage of combustible material
603.3.1	Fuel oil-burning equipment
1105.2	Aircraft towing vehicles
1105.3	Aircraft welding apparatus

1105.4	Aircraft-fueling vehicles
1105.5	Aircraft hydrant-fueling vehicles
1105.6	Aircraft fuel-dispensing stations
1107.7	Heliports and helistops
1110.6.2	Helicopter lift operations
1208.4	Dry cleaning facilities
1415.1	Buildings, structures, premises and facilities under construction, alteration or demolition
1417.3	Roofing operations
1418.1	Powder-actuated tool loads at a construction site
1504.4.10	Spraying spaces
1504.5.5	Limited spraying areas
1505.5.3	Dip-tank rooms and spaces
1506.4.6	Powder coating rooms and spaces
1510.1.2	Floor finishing operations
1908.8	Storage of wood chips and other wood waste materials
1909.5	Exterior lumber storage
2003.5	Organic-coating areas
2106.3	Industrial furnaces
2205.5	Automotive liquid motor fuel-dispensing facilities
2208.7.4.2	CNG motor fuel-dispensing facilities
2210.6.4	Marine liquid motor fuel-dispensing facilities
2211.6	Repair garages
2306.10	High-piled storage
2404.12	Tents and other membrane structures
2508.2	Tire rebuilding/storage
2604.2.6	Welding and other hot work
2707.9.3	Transportation of flammable and combustible liquids in cargo tanks
2903.6 and 2906.6.4	Combustible fibers
3309.9.1	Special effects
3403.2.1	Flammable and combustible liquids, general
3404.3.3.1	Indoor storage of flammable and combustible liquids
3404.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
3405.4.9	Solvent distillation units
3406.2.7	Construction sites—flammable and combustible liquids storage
3406.4.10.1	Bulk plants and terminals for flammable and combustible liquids
3406.8.1(20)	Vapor recovery and processing equipment at bulk plants and terminals
3506.5	Sterilizers using flammable gas containing ethylene oxide
3808.2	LPG

**906.2 General requirements.** Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

**Exceptions:**

1. The travel distance to reach a portable fire extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. In Group I-3, portable fire extinguishers may be provided at staff locations.

**906.2.1 Maintenance.** Portable fire extinguishers shall be maintained in accordance with FC901.6 and this section.

**906.2.1.1 Monthly inspection.** An inspection to verify that the portable fire extinguishers are readily available and in good working order shall be conducted at least once a month. The person conducting such inspections shall keep records of all portable fire

extinguishers inspected, including the date the inspection was performed, the person performing the inspection, and those portable fire extinguishers found to require corrective action. Such recordkeeping shall be either kept on a tag or label securely attached to the portable fire extinguisher, on an inspection checklist maintained on file or by an approved electronic method that provides a permanent record.

**Exception:** An inspection to verify that the portable fire extinguishers are readily available and in good working order shall be conducted at least once every 3 years for dry-chemical or halogenated agent portable fire extinguishers that are monitored by a listed and approved electronic monitoring device complying with all of the following requirements:

1. The electronic monitoring device shall continuously confirm the proper location and charge of each portable fire extinguisher so monitored.
2. Loss of power to the electronic monitoring device or other interruption of the proper functioning of such device shall initiate a trouble signal at an approved location on the premises at which the portable fire extinguisher being monitored is installed.
3. The portable fire extinguisher being monitored shall be located indoors or in cabinets outdoors. The portable fire extinguisher being monitored shall not be in a corrosive environment.
4. The periodic inspection of the portable fire extinguisher shall include inspection and testing of the electronic monitoring device.
5. An electronic record that the electronic monitoring of the portable fire extinguisher is being maintained, and that the portable fire extinguisher is properly located and charged, shall be maintained in accordance with FC107.7.

**906.2.1.2 Servicing.** Annual servicing and recharging shall be performed by a person or company meeting the requirements of FC901.6.3.1. Records of servicing and recharging of portable fire extinguishers shall be provided and maintained in accordance with NFPA 10. The required tag or label for servicing shall also include the following information:

1. The name and certificate of fitness number of the person who serviced the portable fire extinguisher.
2. The month and year the portable fire extinguisher was serviced.
3. The name, street address and telephone number of the portable fire extinguisher servicing company, if any, servicing the portable fire extinguisher.

**906.2.1.3 Hydrostatic testing.** Periodic hydrostatic testing of portable fire extinguishers shall be done in accordance with NFPA 10.



**906.3 Size and distribution.** The size and distribution of portable fire extinguishers shall be in accordance with FC 906.3.1 through 906.3.4.

**906.3.1 Class A fire hazards.** The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class A fire hazard risk (ordinary combustible materials) shall be in accordance with FC Table 906.3.1.

**906.3.1.1 Sprinklered areas.** In buildings classified as Group A-3 occupancy houses of worship and Group B occupancy office buildings that are protected throughout by a sprinkler system, the maximum floor area per unit of A required by FC Table 906.3.1 may be doubled.

**906.3.2 Class B fire hazards.** The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class B fire hazard risk (flammable or combustible liquids with depths of less than or equal to 0.25-inch (6.35 mm)) shall be in accordance with FC Table 906.3.2. The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class B fire hazard risk (flammable or combustible liquids with depths greater than 0.25-inch (6.35 mm)) shall be in accordance with NFPA 10.

**906.3.3 Class C fire hazards.** The minimum size, number and placement of portable fire extinguishers in which there is a Class C fire hazard risk (energized electrical equipment) shall be in accordance with NFPA 10.

**906.3.4 Class D fire hazards.** The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class D fire hazard risk (combustible metals) shall be in accordance with NFPA 10.

**FC TABLE 906.3.1  
PORTABLE FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS**

	LIGHT (Low) HAZARD OCCUPANCY <sup>d</sup>	ORDINARY (Moderate) HAZARD OCCUPANCY <sup>d</sup>	EXTRA (High) HAZARD OCCUPANCY <sup>d</sup>
Minimum Rated Single Extinguisher	2-A <sup>c</sup>	2-A	4-A <sup>a</sup>
Maximum Floor Area Per Unit of A	3,000 square feet <sup>e</sup>	1,500 square feet	1,000 square feet
Maximum Travel Distance to Extinguisher	75 feet	75 feet	75 feet

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 gallon = 3.785 L.

a. Two 2½-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.

b. Reserved.

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.

d. For the purposes of FC Table 906.3.1, the terms “Light (Low) Hazard”, “Ordinary (Moderate) Hazard” and “Extra (High) Hazard” shall be as defined in NFPA 10.

e. In occupancies classified as Groups A-3, B, or E which are protected throughout by a sprinkler system, the maximum floor area per unit of A may be doubled.

**FC TABLE 906.3.2  
FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTHS OF LESS THAN OR EQUAL TO 0.25-INCH<sup>a</sup>**

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

Extra (High)	40-B 80-B	30 50
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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 NFPA 10.

**906.4 Cooking grease fires.** Portable fire extinguishers provided for the protection of cooking grease fires shall be of an approved type compatible with the fire extinguishing system agent and in accordance with FC609.6.

**906.5 Conspicuous location.** Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations shall be along normal paths of travel, unless the commissioner determines that the hazard posed indicates the need for placement away from normal paths of travel.

**Exceptions:**

1. Portable fire extinguishers subject to theft, malicious use or damage may be located in locations approved by the commissioner.
2. In rooming houses and single room occupancies, as defined in the New York State Multiple Dwelling Law, with over 15 sleeping rooms, a 2-A rated portable fire extinguisher may be kept in the apartment of the manager or the building superintendent.

**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, signs or other markings shall be provided to indicate the locations of portable fire 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 be readily identifiable and shall not be locked.

**Exceptions:**

1. Portable fire extinguishers subject to theft, malicious use or damage, if provided with an approved means of ready access.
2. Portable fire extinguishers in Group I-3 occupancies and in mental health areas in Group I-2 occupancies may be locked or located in staff locations, provided the staff of the institution has ready access to the cabinet or other storage location.

**906.9 Extinguisher installation.** The installation of portable fire extinguishers shall be in accordance with FC 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 the top of the extinguisher is 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 the top of the extinguisher is 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 not be less than 4 inches (102 mm).

**906.10 Wheeled units.** Wheeled portable fire extinguishers shall be kept in a designated location that is readily accessible.

## **SECTION FC 907 FIRE ALARM AND DETECTION SYSTEMS**

**907.1 General.** This section governs the operation and maintenance of fire alarm systems and their components.

**907.1.1 Design and installation documents.** Design and installation documents for fire alarm systems shall be submitted to the department for review and approval prior to system installation. Design and installation documents shall include such design and installation details as may be required by the construction codes, including the Building Code.

**907.2 Where required.** An approved manual, automatic, or manual and automatic fire alarm system shall be provided where required by the construction codes, including the Building Code or this code. An approved automatic fire detection system shall be installed in accordance with the construction codes, including the Building Code, and NFPA 72, as modified by FC Appendix B.

**907.3 Fire command center.** Where required by this code or the construction codes, including the Building Code, a fire command center shall be provided for a building, structure or premises.

**907.3.1 Location.** The location and layout of the fire command center shall be approved by the department. A plan identifying the proposed location and layout of the fire command center, including the location, model and certificate of approval number of the fire alarm system control panel, shall be submitted to the department for approval prior to installation.

**907.3.2 Fire alarm system control panel.** The fire alarm system control panel shall be of a type for which a certificate of approval has been issued, and shall be installed in accordance with the Building Code.

**907.3.3 Maintenance.** The fire alarm system control panel shall be maintained in accordance with NFPA 72, as modified by FC Appendix B.

**907.4 Manual fire alarm boxes.** Manual fire alarm boxes shall be installed in accordance with the construction codes, including the Building Code.

**907.4.1 through and including 907.4.4** Reserved.

**907.4.5 Protective covers.** The commissioner may require the installation of manual fire alarm box protective covers to prevent malicious false alarms or provide the manual fire alarm box with protection from physical damage. The protective cover shall comply with the requirements of the construction codes, including the Building Code.

**907.5 through and including 907.7** Reserved.

**907.8 Presignal system.** Where a presignal system is installed, personal supervision shall be provided at an approved location, in order that the alarm signal can be activated in the event of fire or other emergency.

**907.9 through and including 907.12** Reserved.

**907.13 Access.** Access shall be provided to each detector for periodic inspection, testing and other maintenance.

**907.14 Fire extinguishing systems.** Fire extinguishing systems shall be connected to the building fire alarm system where a fire alarm system is required or is otherwise installed.

**907.15 Monitoring.** Where required by this code, the rules or by the construction codes, including the Building Code, such monitoring by a central station shall be performed in compliance with the requirements of the rules.

**Exception:** Central station monitoring is not required for:

1. Single- and multiple-station smoke alarms required by Section 907.2.10 of the Building Code.
2. Smoke detectors in Group I-3 occupancies.
3. Sprinkler systems in Group R-3 occupancies.

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

**907.17 Acceptance testing.** Upon completion of the installation of a fire alarm system, including alarm notification appliances and circuits, alarm-initiating devices and circuits, supervisory-signal initiating devices and circuits, signaling line circuits, and primary and secondary power supplies, such system shall be tested at the owner's risk, by his or her representative, before a representative of the department, to confirm its proper installation and operation of the system in compliance with the requirements of the Building Code and this code.

**907.18 Record of completion.** A record of completion in accordance with NFPA 72, as modified by FC Appendix B, this code and the rules, verifying that the system has been installed in accordance with the approved design and installation documents and specifications shall be provided by the installing contractor.

**907.19 Instructions.** Inspection, testing, operation and maintenance instructions, as built design and installation documents and equipment specifications shall be provided on site at an approved location.

**907.20 Inspection, testing and other maintenance.** Fire alarm and fire alarm detection systems shall be operated and maintained in accordance with this code, FC901, the rules and NFPA 72, as modified by FC Appendix B.

**907.20.1** Reserved.

**907.20.2 Testing.** Testing shall be performed in accordance with the schedules in NFPA 72, as modified by FC Appendix B, or more frequently where required by the commissioner.

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

**907.20.3 Detector sensitivity.** Detector sensitivity shall be checked in compliance with the manufacturer's instructions and NFPA 72, as modified by FC Appendix B, and the rules. Detectors which are connected to a fire alarm system that automatically transmit signals to the department or to a central station shall, as applicable, also be checked in compliance with the rules.

**907.20.4 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 or types of equipment, and detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced:

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 its sensitivity is outside its acceptable sensitivity range; or
5. Another calibrated sensitivity test method acceptable to the commissioner.

**Exceptions:**

1. Detectors listed as field adjustable shall be allowed 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.

**907.20.4.1 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.

**907.20.5 Maintenance.** The owner shall maintain fire and life safety systems in good working order at all times. Service personnel shall possess the qualifications set forth in NFPA 72, as modified by FC Appendix B, and the rules, for inspecting, testing, servicing and otherwise maintaining such systems. When required by the rules, a smoke detector maintenance log book and an alarm log book shall be maintained.

**907.20.6 Smoke detector maintenance.** The owner of any premises, or part thereof, monitored by a fire alarm system or sub-system thereof, whether required or not required by this code, which automatically transmits signals to the department or to a central station, shall be responsible for preventing unnecessary and unwarranted alarms as set forth in rules. Cleaning and testing of smoke detectors shall be performed as set forth in the rules.

**907.20.7 Hold-open devices.** The fire alarm system connections for hold-open devices installed on fire doors pursuant to the Building Code, including hold-open devices provided for vertical exit enclosure doors pursuant to the exception to Section BC 708.7 of the Building Code, shall be inspected, tested and otherwise maintained in accordance with FC 703.2 and 907.20 and NFPA 72. Hold-open devices and automatic door closers provided for such vertical exit enclosure doors shall be inspected and tested annually to ensure the proper functioning of:

1. the manual control on the fire alarm system control panel, or the fire command center where a fire command center is required, that transmits a signal to release the hold-open devices;
2. the fire alarm system output programming, which automatically transmits a signal to release the hold-open devices upon activation of an automatic alarm initiating device or manual elevator recall;
3. the circuitry for each hold-open device, which upon receipt of a manual or automatic signal, releases the door; and
4. each automatic door closer, which, upon release of the door by the hold-open device, mechanically moves the door to its fully closed position. *(Added by LL 17/2014, effective 10/1/14)*

## SECTION FC 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 FC Chapter 27.

**908.2 Group H-5 occupancy.** Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in FC1803.12. A continuous gas detection system shall be provided for HPM gases in accordance with FC1803.13.

**908.3 Highly toxic and toxic materials.** Where required by FC3704.2.2.10, a gas detection system shall be provided for indoor storage and use of highly toxic and toxic compressed gases.

**908.4 Ozone gas-generator rooms.** A gas detection system shall be provided in ozone gas-generator rooms in accordance with FC3705.3.2.

**908.5 Repair garages.** A flammable-gas detection system shall be provided in repair garages for vehicles fueled by non-odorized gases in accordance with FC2211.7.2.

**908.6 Refrigerating systems.** Refrigerating system machinery rooms shall be provided with a refrigerant detector in accordance with FC606.8 and the Mechanical Code.

**908.7 Carbon monoxide.** Carbon monoxide alarms and carbon monoxide detectors shall be installed where required by the construction codes, including the Building Code and, where applicable, the requirements of the New York City Department of Housing Preservation and Development.

**908.8 Medical gas systems.** Medical gas systems shall comply with the requirements of FC3006.4 and the construction codes, including the Building Code.

**908.9 Flammable gas.** Flammable gas detection systems shall be as set forth in the construction codes, including the Building Code, this code or the rules.

**908.9.1 Flammable gas distribution piping.** Areas within buildings and structures containing flammable gas distribution piping operating at levels above 15 pounds per square inch (psig)(103.4 kPa) shall be provided with an approved flammable gas detection-alarm system.

**908.10 Maintenance.** Emergency alarm and detection systems governed by this section shall be inspected, tested, serviced and otherwise maintained in accordance with the manufacturer's specifications. Those approved for connection to a fire alarm system or which will transmit an alarm to a central station shall additionally comply with the requirements of NFPA 72, as modified by FC Appendix B, and the rules governing the operation and maintenance of such systems.

**908.10.1 Carbon monoxide.** Carbon monoxide detectors shall be inspected, tested, serviced and otherwise maintained in compliance with the requirements of the construction codes, including the Building Code, and, where applicable, the requirements of the New York City

Department of Housing Preservation and Development. Those connected to a fire alarm system or which will transmit an alarm to a central station shall additionally comply with the requirements of FC901.6, NFPA 72, as modified by FC Appendix B, NFPA 720 and the rules governing the operation and maintenance of such systems.

## **SECTION FC 909 SMOKE CONTROL SYSTEMS**

**909.1 Smoke control systems.** Smoke control systems, including stairwell pressurization, shall be provided as required by the construction codes, including the Building Code, and shall be designed, installed and tested as required by such codes.

**909.1.1 Smoke control system maintenance.** Smoke control systems shall be maintained in good working order. Periodic testing, inspection and other maintenance shall be performed in accordance with the manufacturer's instructions and FC 909.1.1.1 through 909.1.1.3.

**909.1.1.1 Schedule.** A written maintenance program, including periodic inspection and testing, shall be established and implemented immediately upon installation of the smoke control system.

**909.1.1.2 Recordkeeping.** A logbook or other approved form of recordkeeping documenting each inspection and test shall include the date of the maintenance, identification of servicing personnel, description of any operating defects or deficiencies, notifications made, corrective action taken, including parts replaced, and/or other information prescribed by the department by rule.

**909.1.1.3 Testing.** Operational testing of the smoke control system shall include all components of the system, including initiating devices, fans, dampers, controls, doors and windows. Dedicated smoke control systems shall be tested semiannually. Nondedicated smoke control systems shall be tested annually. All systems shall be tested under both normal power and emergency power.

**909.2 Post-fire smoke purge systems.** Post-fire smoke purge systems shall be provided as required by the construction codes, including the Building Code, and shall be designed, installed and tested as required by such codes.

**909.2.1 Post-fire smoke purge system maintenance.** Post-fire smoke purge systems shall be maintained in good working order. A record of inspections and tests shall be maintained in accordance with FC107.7.

## **SECTION FC 910 SMOKE AND HEAT VENTS**

**910.1 General.** Smoke and heat vents or, where approved by the Commissioner of Buildings, mechanical smoke exhaust systems, and draft curtains shall be installed when required by the construction codes, including the Building Code, this code or the rules, and shall be designed and installed in accordance with the construction codes, including the Building Code.



**910.2 Maintenance.** Automatically and manually operated heat vents and engineered mechanical smoke exhaust systems shall be inspected periodically and an operational test of each shall be conducted at least once every 12 months. A record of each inspection and test shall be maintained as required by FC 107.7 and 901.6.2.

**Exception:** Gravity operated drop out vents need only be inspected.

## SECTION FC 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 set forth in FC Table 911.1.
2. Where quantities of hazardous materials specified in FC Table 911.1 exceed the maximum allowable quantities set forth in FC Table 2703.1.1(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.

**FC TABLE 911.1  
EXPLOSION CONTROL REQUIREMENTS**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems
<b>Hazard Category</b>			
Combustible dusts <sup>a</sup>	—	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 <sup>b</sup>	Not required	Required
	IB <sup>c</sup>	Not required	Required
Organic peroxides <sup>c</sup>	Unclassified Detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric material <sup>c</sup>	Detonable	Required	Not permitted
Pyrophoric gases <sup>c</sup>	Nondetonable	Not required	Required
Unstable (reactive) <sup>e</sup>	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids <sup>e</sup>	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
	2 detonable	Required	Not permitted
	2 nondetonable	Not required	Required
<b>Special Uses</b>			

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Grain processing	—	Not required	Required
Where explosion hazards exist <sup>d</sup>	Detonation Deflagration	Required Not required	Not permitted Required

- a. Combustible dusts that are generated during manufacturing or processing. See definition of Combustible Dust in FC Chapter 2.
- b. Storage or use.
- c. In open use or dispensing.
- d. Rooms containing dispensing and use of hazardous materials when 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. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) are considered as explosives for purposes of storage.

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

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 not be less than five times the maximum internal relief pressure specified in FC911.2(5).

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 streets.

4. The aggregate clear area of vents and venting devices shall be governed by the pressure resistance of the construction assemblies specified in FC911.2(1) and the maximum internal pressure allowed by FC911.2(5).

5. Vents shall be designed to withstand loads in accordance with the construction codes, including the 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 construction codes, including the 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 outdoors 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 property line.

**Exception:** Vents complying with the requirements of FC911.2(7).

7. Vents designed to remain attached to the building when venting a deflagration shall be so located that the discharge opening shall not be 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 property, and from the property line.

8. Vent lines shall discharge outdoors.

**911.3 Explosion prevention systems.** Explosion prevention systems shall be of an approved type and installed in accordance with this code and NFPA 69. Where the building or structure or part thereof is provided with a fire alarm system, explosion prevention system alarms shall be transmitted to the fire alarm system control panel and to an approved central station.

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

## **SECTION FC 912 FIRE DEPARTMENT CONNECTIONS**

**912.1 Installation.** Fire department connections shall be installed in accordance with the construction codes, including the Building Code.

**912.2 Location.** The location of fire department connections shall be in accordance with the Building Code.

**912.2.1 Visible location.** Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department apparatus access, or as otherwise approved by the commissioner.

**912.2.2 Distance from hydrant.** Fire department connections shall be located at a distance from the nearest fire hydrant as required by the Building Code.

**912.3 Access.** Immediate access to fire department connections shall be maintained at all times, without obstruction by fences, posts, bushes, trees, rubbish containers, vehicles, walls or other objects.

**Exception:** Access to fire department connections may be obstructed by a fence, provided that such fence has an approved access gate complying with the design, installation, operation and maintenance requirements of FC912, including signage complying with FC912.4, and a means of emergency operation.

**912.3.1 Locking fire department connection caps.** The commissioner may require locking caps on fire department connections for sprinkler and standpipe systems.

**912.3.2 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 around wall-mounted and free-standing fire department connections, except as otherwise required or approved.

**912.3.3 Physical protection.** Where fire department connections are subject to impact by a motor vehicle whose normal operation brings it into proximity with such connections, such as when fire department connections are located curbside or adjacent to loading or parking areas, vehicle impact protection shall be provided in accordance with FC312.

**912.4 Marking.** Wall hydrants and fire pump test headers located on the exterior of buildings shall be conspicuously marked to indicate their function. Fire department connections shall be marked as follows:

1. Fire department connections serving a standpipe system shall be provided with caps painted red, and shall have the word "STANDPIPE" in letters 1 inch (25 mm) high and 1/8 inch (3.2 mm) deep cast in the body or on a non-ferrous metal plate secured to the connections or mounted on the wall in a visible location, except that caps of fire department connections used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read: "COMBINATION STANDPIPE AND SPRINKLER SYSTEMS."
2. Fire department connections serving a sprinkler system protecting an entire building or structure shall be provided with caps painted green and shall have the word "SPRINKLER" in letters 1 inch (25 mm) high and 1/8 inch (3.2 mm) deep cast in the body or on a non-ferrous metal plate secured to the connections or mounted on the wall in a visible location, except that caps of fire department connections used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read: "COMBINATION STANDPIPE AND SPRINKLER SYSTEMS."
3. Fire department connections serving a non-automatic sprinkler system shall have the entire connection painted silver.
4. Fire department connections serving a sprinkler system protecting only a portion of a building or structure shall have durable metal signs securely fastened to, or above, the connection indicating the portion of the building or structure protected.

**912.5 Backflow protection.** The potable water supply to all sprinkler systems and standpipe systems shall be protected against backflow as required by the construction codes, including the Plumbing Code, and the requirements of the Department of Environmental Protection.

**912.6 Maintenance.** Sprinkler system and standpipe system fire department connections shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and NFPA 25. Upon order of the commissioner, but at least once every 5 years, such fire

department connections shall be subjected to a hydrostatic pressure test to demonstrate their suitability for department use. The test shall be conducted in accordance with the rules and at the owner's risk, by his or her representative before a representative of the department.

## **SECTION FC 913 FIRE PUMPS**

**913.1 General.** Where provided, fire pumps shall be installed in accordance with this section, the construction codes, including the Building Code, 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.

**913.3 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 the isolation valves on the backflow prevention device or assembly shall be supervised open by a fire alarm system and monitored by an approved central station.

**913.4.1 Test outlet valve supervision.** Fire pump test outlet valves shall be supervised in the closed position.

**913.5 Operation and maintenance.** Fire pumps shall be operated and maintained in compliance with the requirements of this section, FC901.6 and NFPA 25, including all required inspection, testing and servicing.

**913.5.1 Acceptance test.** Acceptance testing shall be done in accordance with FC901.5 and NFPA 20. Acceptance tests shall be conducted at the owner's risk by his or her representative before a representative of the department.

**913.5.2 Generator sets.** Engine generator sets supplying emergency power to fire pump assemblies shall be periodically tested in accordance with FC604 and the Electrical Code.

**913.5.3 Transfer switches.** Automatic transfer switches shall be periodically tested in accordance with FC604 and the Electrical Code.

**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.

**913.6 Fire pump supervision.** The following fire pump operations shall be electrically supervised by the fire alarm system in accordance with the Electrical Code and NFPA 20; and monitored by a central station in accordance with this code and the rules:

1. Pump running.
2. Pump power failed.
3. Pump phase reversal.

## **SECTION FC 914 YARD HYDRANT SYSTEMS**

**914.1 General.** Yard hydrant systems shall be installed where required by the construction codes, including the Building Code, this code, including FC508.2.3, or the rules.

**914.2 Operation and maintenance.** Yard hydrant systems shall be operated and maintained in accordance with FC901.6 and NFPA 25.

**914.3 Supervision.** At all times when the area served by the yard hydrant system is in use, the system shall be under the personal supervision of a certificate of fitness holder, who shall be available to assist the department in the operation of such system.